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No. 6

USDA Estimates 28 Million Acres In Reserve

Only General Cropland Eligible for 1960 Contracting Program

WASHINGTON—The U.S. Department of Agriculture estimates that more than 28 million acres of cropland will be held out of production in 1960 under Conservation Reserve contracts.

Under the Conservation Reserve, farmers contract to withhold general cropland from production for periods of three to 10 years, while carrying out soil, water and wildlife conservation practices.

The USDA estimates include nearly 22½ million acres from contracts which started in 1959 or earlier and the rest from the current sign-up. Only cropland is eligible for the Conservation Reserve. Generally, it must have produced a crop or been in a regular crop rotation during the year immediately preceding the first year of the contract.

On the basis of data from contracts, performance reports, and applications, USDA has computed the former cropping use of the total 1960 acreage and the production that would be expected at average yields appropriate for the quality and location of the land. The following table shows these acreage and production estimates for the leading crops:

Former Cropland Use	Est. Former Acreage	Est. Normal Production
Corn	4,400,000	183,200,000*
Wheat	3,100,000	61,600,000*
Cotton	650,000	490,000*
Peanuts	140,000	132,000,000*
Tobacco	15,000	22,300,000*
Oats	4,100,000	131,400,000*
Barley	1,600,000	42,500,000*
Soybeans	1,100,000	21,200,000*
Sorghum grain	3,900,000	109,500,000*
Flaxseed	400,000	4,400,000*
Cropland hay and pasture	5,000,000	7,400,000*

*Bushels
*Lbms
*Pounds
*Tons (hay equiv.)

Fertilizer Use 25,143,000 Tons In 1958-59, USDA Report Says

WASHINGTON—An increase of 11.7% over previous years in the quantity of primary plant nutrients, as well as in the quantity of fertilizer carriers consumed, was recorded in the United States during the year ended June 30, 1959, according to a preliminary report issued last week by the Fertilizer Investigation Research Branch, Agricultural Research Service, U.S. Department of Agriculture. Total consumption was 25,143,000 tons, some 2,627,000 tons over the figures of 1957-58.

The report indicated that the upward swing in fertilizer consumption

was related to the increased acreage of certain crops and to the impact of State soil fertility programs.

Compiled by Walter Scholl, Marion M. Davis, Esther I. Fox and Caroline A. Wilker of the fertilizer investigations research branch, Beltsville, Md., the report is based on shipments of manufacturers, liquid nitrogen applicators, and State tonnage reports. Estimates of the nutrient contents were determined from average analyses of samples of products as reported by State fertilizer control officials, the authors said.

The increased consumption of fer-

tilizers was noted in all but seven states. These states, representing 1,827,000 tons, or 7.3% of the total consumed in the U.S., consumed 49,000 fewer tons than they did the previous year.

Increases registered in the South Atlantic region were 705,000 tons (12.4%); in the West North Central region, 621,000 tons (26.9%), and in the Pacific region, 419,000 tons (16.0%). Substantially more fertilizer was also used in the East North Central and East South Central regions. More than one-half of the increase in consumption of fertilizer in the Pacific region was in the secondary and trace nutrient materials, principally gypsum.

The total use of fertilizer in the South Atlantic and South Central regions which has steadily decreased since the peak consumption of 11,058,695 tons in 1951-52 consumed nearly that amount in this period.

Mixtures

Mixed fertilizers comprised 63.3% of the total tonnage of fertilizer consumed and amounted to 15,921,000 tons—an increase of 1,568,000 tons (10.9%). This is the first year since 1952-53 that mixtures have shown an increase and the total establishes a new peak in consumption. Regions in which the principal increases occurred followed closely those Regions having corresponding changes in consumption of all fertilizers.

There were 46 grades consumed in amounts of 50,000 tons or more, totaling 12,635,000 tons—accounting for nearly 80% of the tonnage of mixed

(Turn to CONSUMPTION, page 4)

Governmental Regulation of Chemicals Noted at Pacific Northwest Spray Conference

By Bob Holley
CropLife Special Writer

PORTLAND ORE.—Various government regulations concerning the use of agricultural chemicals came in for more than the normal amount of attention at the annual series of conferences which brought a record number of private industry, federal and state chemical specialists and entomologists here during the week ended Jan. 23.

A new Northwest Agricultural Chemicals Industry conference attendance mark was established for the second consecutive year with 140 industry members and representatives of allied industries attending from Oregon, Washington, Idaho, British Columbia, California, Nevada and Utah, reports Charles O. Barnard, San Jose, executive secretary of the Western Agricultural Chemicals Assn.

A number of pointed questions were fired during a joint session by representatives of the Pacific North-

west Vegetable Insect conference, the Western Cooperative Spray Project conference and the Northwest Agricultural Chemicals Industry conference in the direction of one of the principal speakers, Kenneth E. Monfore, chief, Seattle district of the U.S. Food and Drug Administration.

Most of these questions concerned the application of the federal law and its amendments to the use of chemicals on fruit and vegetable crops with the emphasis of the amount of tolerance allowed for some of the principal insecticides and pesticides.

"In order to keep pace with the world's expanding population, all segments of the horticultural, chemical, processing, packaging and distribution food teams must seek means to increase efficiency to assure a bountiful supply of safe foods," Mr. Monfore emphasized in his industry talk. "However, an increase in production and grade quality of crops must not occur at the expense of safety and purity of our foods."

Mr. Monfore also explained the Miller bill of 1954 and the food additive amendment passed in 1958 and declared that the basic purpose of each amendment is the same—namely "the protection of the consumer"

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Research Reports Claim Largest Share of Study at New Mexico Chemical Conference

UNIVERSITY PARK, N.M.—The crucial role of chemicals in New Mexico's expanding fruit, vegetable, and field crop economy was stressed here in three consecutive New Mexico State University meetings Jan. 13-15.

At the 3rd New Mexico Agricultural Chemicals Conference on the first day, Jan. 13, research reports stressed progress gained with both fertilizers and insecticides. Then at the fourth annual New Mexico fruit short course, the emphasis shifted to chemical aids in good orchard management, and at the following day's vegetable course speakers urged modern cultivation practices to meet the current demand for quality.

Lead-off speaker for the chemicals

conference was Dr. Robert H. Black, dean of agriculture and director of the New Mexico State University Experiment Station. Dr. Black told the 150 specialists and producers that "keeping up with the times in agricultural research is a rugged problem. There are so many things being done in research and so many that need to be done. The state and federal governments are spending \$238 million annually on agricultural research. Private industry is spending as much as both the state and federal governments. If we double our population by 2010, as economists predict, think of how much we will need to step up our research program to pro-

(Turn to RESEARCH, page 3)

Dean R. Gidney Elected Vice President of PCA

WASHINGTON—Dean R. Gidney has been elected vice president in charge of sales of Potash Company of America, according to an announcement by John W. Hall, president. The action was taken by the PCA board of directors on Jan. 20, and the assignment was effective as of Feb. 1.

Mr. Gidney, long associated with the potash industry, takes the place vacated by Mr. Hall on Dec. 15, 1959, when the latter was made president of the company. Mr. Gidney's experience in the potash industry has been in sales and sales management, starting as a salesman in 1937, being promoted later to vice president in charge of sales, and most recently general manager of the potash division of U.S. Borax and Chemical Corp.

He is a graduate of Dartmouth College and served in the U.S. Navy during World War II. He has also served on the board of directors of both the National Plant Food Institute and the American Potash Institute, Inc.

Headquarters of PCA's sales organization will be maintained in Washington, according to Mr. Hall.



Robert L. Olcott A. Dale McConathy

Monsanto Moves Iowa Sales Headquarters

ST. LOUIS — Monsanto Chemical Co.'s organic chemicals division has transferred its agricultural chemicals sales headquarters for the north central area from Des Moines, Iowa, to Kansas City, Mo., effective immediately.

Robert L. Olcott of Des Moines, Monsanto agricultural chemicals sales supervisor for the area, opened his new office on Feb. 1 in the VFW Bldg., 406 W. 34th St., Kansas City.

Sales responsibilities for Iowa and eastern Nebraska are being taken over by A. Dale McConathy of St. Louis. He will locate in Des Moines.

Mr. Olcott, originally of Cummings, Iowa, received a B.S. degree in agronomy from Iowa State University in 1952 and joined Monsanto that year. He became a salesman of the company's formulation farm chemicals in 1955 and was appointed to his present position in January, 1959.

Mr. McConathy, a native of White Hall, Ill., received a B.S. degree in agriculture (1943) from the University of Illinois. He was a salesman for Swift & Co. and managed a 750-acre farm in Illinois before joining Monsanto in 1959.

New Insecticide

NEW YORK—A new systemic insecticide designed to give young cotton plants protection against a variety of insects has just been placed on the market by Chemagro Corp. Called Di-Syston, the insecticide has been registered for use nationally by the U.S. Department of Agriculture.

The product is for use to protect young cotton plants against the attack of aphids, mites, and thrips, yet is harmless to predators. The product, in granular form, is applied to the ground at the same time the cotton seeds are planted. Thus the seeds and young plants take up the insecticide in systemic form. It has a long-lasting residual action, and will give protection against the aforementioned insects up to seven weeks after seedling emergence, the company says.

Alabama Pest Control Conference Scheduled

AUBURN, ALA.—The 13th Alabama Pest Control Conference will be held Feb. 17-18 at Duncan Hall on the Auburn University campus here. The meeting is sponsored by the Alabama Association for Control of Economic Pests in cooperation with Auburn.

An extensive and varied program is planned, featuring such topics as pest control in Alabama, the need for pesticides in modern America, weed control, pesticide application equipment and public relations and the pesticide industry.

A number of top speakers are scheduled to address the conference. Included among them are L. S. Hitchner, executive secretary of the National Agricultural Chemicals Assn.; Dr. G. J. Haeussler, assistant director, Entomology Research Division, Agricultural Research Service, U.S. Department of Agriculture, and Louis Throgmorton, vice president of the Republic National Life Insurance Co., Dallas, Texas.

John B. Plant Joins Geigy Sales Staff

ARDSLEY, N.Y.—Geigy Agricultural Chemicals, division of Geigy Chemical Corp., announces the appointment of John B. Plant to its western sales staff.



John B. Plant

Mr. Plant was born in San Diego, Cal., in 1931. He attended San Diego State College and Utah State University, where he specialized in entomology and also botany. After receiving the Bachelor of Science degree at Utah in 1954, he continued graduate work in entomology. During his studies, he assisted in teaching, carried on agricultural extension projects, and also held a research assistantship in soil insecticides sponsored by Shell Chemical Co.

From 1955 to 1957, Mr. Plant was field representative for California Spray-Chemical Co. in Orange County, Cal. He then acted as dealers' representative for the L. H. Butcher Co. until his appointment by Geigy.

Dr. W. G. Eden, president of the association and entomologist with Auburn University, will preside.



AT WASHINGTON CONFERENCE—C. B. Harrison, Washington State University extension soils specialist, left, co-chairman of the Central Washington fertilizer conference held at Pasco, Wash. Jan. 25, confers on the program with Lyle Neff, Pasco manager for Agriform Company of Washington, who was in charge of local arrangements. More than 75 dealers and 15 industry representatives attended the conference. (Crophlife, Jan. 25, page 1.)

CFA Announces November Convention

SACRAMENTO, CAL.—The 37th Annual Convention of the California Fertilizer Assn. will be held at the Hotel del Coronado, Coronado, Cal., Nov. 13-15, according to an announcement issued by Demont W. Galbraith, president. Between 500 and 600 persons are expected to attend.

Frank Scoville, Wilbur-Ellis Co., San Diego, is chairman of the program committee, and Frank McGrane, American Potash & Chemical Corp., heads the convention entertainment committee. Mr. Galbraith said a ladies program committee will soon be appointed.

Mr. Scoville said that the program is now being developed and will be announced at a later date. He said that management and sales people of the industry from various parts of the country and from Canada and Mexico, with their ladies, will make up the majority of those attending.

A one day business program will provide for election of four directors for three year terms, election of 1961 officers, action on the proposed budget for 1961, and about two formal papers on subjects of interest and concern to the industry. A noted personality will be featured at the Nov. 14 luncheon. The annual banquet will be held on the evening of Nov. 15.

Canadians Find Gypsy Moth Infestations; Precautions Help With Early Discovery

OTTAWA—Gypsy moth infestations have been uncovered in southern Quebec and control measures are under study by federal authorities. This is the third time in 35 years that an outbreak of this pest has been reported in Canada.

Assiduous precautions paid off in the early discovery of this latest outbreak. For five years, a constant vigil has been kept on border areas that seemed likely targets for the gypsy moth from the eastern U.S.

L. L. Reed, who directs survey work for the plant protection division, Canada department of agriculture, explained that upwards of 500 sex-attractant metal traps, loaned by the U.S. Department of Agriculture are used each year during the flight season.

Since only the male gypsy moth flies, cartridges containing the scent of the female moth are used to lure them into the traps where they are caught on pieces of cardboard smeared with tanglefoot.

Only a few male moths were caught in previous years. Last fall, though, 97 moths were trapped—52 of them in Chateauguay County, Quebec.

A ground survey confirmed the story told by the traps. Three distinct infestations were brought to light, the largest involving 300 egg masses and the other two containing 25 and 19 respectively. Each mass contained an average of 400 eggs. They were found attached to the trunks of trees and on the undersides of stones adjacent to the trees on which the larvae had fed.

First outbreak in Canada was discovered in 1924 south of Montreal,

near the U.S. border. It was stamped out through combined efforts of federal, provincial and USDA officials. Again in 1937 several smaller infestations were located in Charlotte County, New Brunswick. They were eradicated in a similar manner.

Mr. Reed said the first gypsy moths were brought from Europe to Massachusetts by a French scientist for experimental purposes. Some of the moths escaped and although the authorities were informed, they were unimpressed. To them, the moth was "just another bug." A few years later, the pest began leaving its trade mark in the shape of defoliated and dying trees over hundreds of acres. A concentrated effort brought the outbreak under control, but laxity subsequently allowed the gypsy moth to flourish again.

The gypsy moth at first was confined to the New England states but gradually spread towards the west and southwest. In the past few years, it has moved up the west side of Lake Champlain, in New York state, and into northern New Jersey and parts of Pennsylvania. A strict federal quarantine, in effect for many years, has retarded more extensive spread.

Newly hatched larvae spin the upper branches of the trees on which they are feeding. Strong winds break these threads and larvae may be carried several miles before dropping to new feeding areas. Egg masses attached to logs, lumber and quarry products, also contribute to the spread of the pest when this material is transported.

Through continued diligence, Canada proposes to maintain effective controls over the gypsy moth.

EUROPEAN CORN BORER ABUNDANCE

FALL 1959



CORN BORER ABUNDANCE—Results of USDA survey in 20 states showing the abundance of European corn borer in 1959 are shown above. The numbers in states and districts indicate the average number of borers per 100 stalks. Spread of the pest in 1959 was rather limited, with a total of 13 new counties reporting its presence. These areas were in Arkansas, Alabama, Colorado, Georgia, Michigan, North Carolina and Texas. In 1958, a total of 58 new counties and parishes reported infestations for the first time. The above map was prepared by the survey and detection operations, USDA.

Fertilization the Key in Making Range Operation Pay Farmer Big Dividends

By D. R. Keim*

Manager, Market Development
Wilson & Geo. Meyer & Co.
San Francisco, Cal.

OVER THE PAST five years some excellent work has been done on range and pasture fertilization. The University of California and California State Polytechnic College have worked closely with the fertilizer industry of California in making excellent use of donations of material to develop and interpret the results of fertilizing range and pasture land under a wide variety of soil and climatic conditions.

There is very little guess work left. In Madera County results are positive on the amount of ammonium sulfate to use to grow more range pasture profitably.

On Northern California's terrace ranges, single superphosphate produced additional rose clover feed for as little as \$4.37 a ton.

Proper use of nitrogen and phosphate in December on Northern California range land can put grazing animals on native forage a month to six weeks earlier.

By changing native forage from principally grasses to a healthy combination of grass and clovers, fertilizer again can help produce high quality feed at very low cost per ton.

On irrigated pastures pelleted single superphosphate can be applied in the fall for vigorous clover response and nitrogen can be used when needed during the spring and summer to keep the grasses in proper balance with the clover.

On primarily grass irrigated pastures in the Central San Joaquin Valley, nitrogen and phosphate have been used in balance for profitable yield response.

There are endless examples throughout California showing how fertilizers can be used to produce this lower cost feed. No one formula can possibly fit the needs of every ranch, nor can any one program or any one cost. But the fact remains if cattle or sheep are grazed, there is a seeding program, a grazing program, a fencing program, and a fertilizer program in addition to weed and brush control programs to help land produce feed at a lower cost.

Getting down to dollars and cents, a farmer should just jot down the amount of feed he buys, whether it be 400 tons, 1,000, 800 or perhaps 100. He should then compare what it costs to buy this amount of alfalfa against what it would cost to produce this extra feed on his own land with a suitable soil improvement program.

Table 1 compares various hay tonnages at two different values of alfalfa hay to the same tonnages at two different possible costs to produce that "extra" feed. (Quality compensations would also have to be calculated). The "possible savings" show what might be saved under these conditions, and we can see that we are talking about real dollar savings.

On one particular ranch the preferred program may take \$15.00 worth of fertilizer per acre to produce 2,000 pounds of additional good quality feed. On 400 acres this would represent \$6,000. The 400 tons of additional feed could represent a market value of around \$10,000. The \$6,000 investment would have produced \$10,000 worth of feed with a

profit of \$4,000, if the quality of the range feed was comparable.

One particular range improvement program in California stands out as an excellent means of producing high quality feed for low cost. That program is to improve the range forage by seeding annual clovers and ferti-

lizing that clover to get its maximum yield.

In the "Results of 13 Grazing Tests on Annual Range—1956-57 Season," Martin, Berry and Williams reported excellent results of fertilizing a rose clover stand on unirrigated range in Placer County. This test was measured over a two year period. During this time 600 pounds of single superphosphate per acre was applied the first year only. A total of 2355 pounds of extra forage per acre was produced

the first year and 2107 pounds per acre the second year. The cost per ton to produce this extra feed was \$4.60.

Circular No. 458, published by California Agricultural Experiment Station Extension Service, is titled "Production of Range Clovers." It clearly describes how to improve rangeland and forage by planting clover—Rose Clover, Crimson Clover, Bur Clover, and/or Sub Clover. In it single superphosphate is referred to as supplying

(Turn to DIVIDENDS, page 25)

TABLE 1. How Much Feed Do You Buy?

Tons of feed	Cost of feed from various sources—				Possible savings
	Alfalfa—		Investment for increased pasture production		
	\$25/ton	\$30/ton	\$10/ton	\$15/ton	
100	\$ 2,500	\$ 3,000	\$ 1,000	\$ 1,500	\$ 1,000-\$ 2,000
1,000	\$25,000	\$30,000	\$10,000	\$15,000	\$10,000-\$20,000
800	\$20,000	\$24,000	\$ 8,000	\$12,000	\$ 8,000-\$16,000
400	\$10,000	\$12,000	\$ 4,000	\$ 6,000	\$ 4,000-\$ 8,000

Western fertilizer dealers...

LET'S GET TOGETHER!

Your market is full of opportunities for men with ideas . . . who can act fast! If you have been thinking how you could improve your fertilizer sales picture by expansion, diversification, better equipment, or by solving inventory or finance problems, we can probably help you do it.

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Call one of these Brea Brand sales representatives. Give him a chance to pitch in with you and come up with a good, practical marketing approach. You'll find him eager to help . . . capable and experienced . . . backed by an organization that can make fast decisions.

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MANUFACTURER OF
BREA BRAND FERTILIZERS SOLUTIONS AND DRYS



*From paper presented before California Section of the American Society of Range Management, Nov. 19, 1959.

1,200 Attend Memphis Agricultural Clinic

By EMMETT ROBINSON
and ED WHITE
Croplife Special Writers

MEMPHIS—More than 1,200 agricultural chemical dealers, manufacturers' representatives and farmers attended an Agricultural Chemical Clinic here Jan. 26-27.

The meeting, sponsored by the Chapman Chemical Co., offered industrial representatives the chance to inform county agents, dealers and farmers about the proper uses of the latest products. Robert January, Chapman agricultural sales manager, pointed out that the clinic, which will be held each year, is an "educational meeting and not a sales clinic."

R. C. Harden, executive vice president, Chapman Chemical Co., said that there are many costly production problems that machines cannot solve. "Insects and weeds cost our nation's farmers billions of dollars annually and so far no machine has been developed to control insects or weeds growing in the crop row or appearing after a crop is too big to put machines into it. Thus if we are to greatly lower our production costs in the future it must be with these new tools known as chemicals."

"Chemicals represent the power to kill millions of insects with a few ounces of material, the power to reach between crop plants and destroy unwanted weeds, the power to selectively kill weeds and not harm farm crops, the power to return \$10 to \$20 for every dollar invested in them. These are powers only chemicals possess, and if we are to make these powers ours, we must know these chemicals; what they are, what they will do, what they won't do, when to use them, how much to use and when to apply them. These things we must know to control this power and those who take the time and make the effort will be amply rewarded."

K. P. Ewing, Hercules Powder Co., reported that early season control of insects is most important. "A \$100 to \$150 loss an acre in cotton can occur from 75% boll weevil infestation. That's why early season control is important."

Gilbert Betulious, Hahn, Inc., pointed out that improper application of agricultural chemicals results in waste and low crop protection. He said that agricultural implement dealers should take more time to teach farmers how to operate their spray rigs more effectively.

Pre-emergence herbicides represent one of the most advanced steps in weed control in the past 10 years, according to Dr. E. C. Spurrier, Monsanto Chemical Co. Dr. Spurrier sketched the possibilities offered by Randox-T, a new herbicide to be available this year in liquid and granular forms. It is said to control broadleaf weeds as well as grasses.

C. H. Starker, Gandy Co., Inc., contended that application of granular chemicals can be more effective than sprays. "All you need to do is put the material in a hopper and adjust one dial in relation to the rate of chemicals to be used," he said.

Stan Adams, Chemagro Corp., reported that proper cotton defoliation costs range from \$1.85 to \$2.40 per acre. Mr. Adams said that Chemagro's Def, when applied correctly, resulted in a 90% leaf and stem drop.

Co-sponsors of the meeting included Niagara Chemical Division, Chemagro Corp., the Dow Chemical Co., E. I. du Pont de Nemours & Co., Inc., Shell Chemical Corp., Monsanto Chemical Co., Geigy Agricultural Chemicals, Naugatuck Chemical Division of U.S. Rubber, and California Spray-Chemical Co.

CONSUMPTION

(Continued from page 1)

fertilizers consumed and approximately 1,650 other grades accounting for the remaining 20% in 1958-59. The 46 grades are listed in Table 2.

While consumption of most of the 46 grades increased, six grades—4-12-12, 5-10-10, 5-10-15, 5-20-20, 6-12-12, 12-12-12—represented nearly 60% of the total increase in consumption of mixed fertilizers. These are the grades generally consumed in largest tonnages throughout the central and southeastern states.

Materials

The consumption of direct application materials amounted to 9,222,000 tons comprising 36.7% of all fertilizers consumed in the year ended June 30, 1959. Included in this tonnage are 7,996,000 tons of products containing one or more of the primary plant nutrients, 1,214,000 tons of products containing only secondary and trace nutrients, and 12,000 tons of products not classified (Table 3).

The consumption of materials containing primary nutrients increased 785,000 tons (10.9%) and secondary and trace nutrient materials 274,000 tons (29.2%) from the respective quantities of 1957-58. The change in consumption of direct application materials corresponded closely with the change in consumption of mixed fertilizers in most all of the Regions.

More than 73% of the increase in consumption of the primary nutrient materials was in the class of chemical nitrogen materials. Consumption of this class was 576,000 tons (14.8%) more than in 1957-58. Increases in the other classes of materials were 144,000 tons (6.0%) for phosphates, 40,000 tons (8.9%) for potash, and 13,000 tons (2.7%) for the natural organics.

Primary Plant Nutrients—During the year ended June 30, 1959, fertilizers used in the United States contained 7,396,000 tons of primary plant nutrients (N, available P₂O₅, K₂O) (Table 4). This represented a substantial increase in primary nutrients (884,000 tons, 13.6%) from that consumed in the preceding year.

Consumption of nitrogen was 2,643,000 tons, an increase of 359,000 tons (15.7%); that of available P₂O₅, 2,576,000 tons—283,000 tons (12.3%) more; and that of K₂O, 2,177,000 tons—242,000 tons (12.5%) above their amounts in 1957-58. Consumption of these nutrients increased substantially over any previous year and reflects the removal of acreage allot-

ments as well as soil fertility programs.

Primary nutrients in mixed fertilizers represented: 37.3% of the nitrogen, 78.8% of the available P₂O₅, and

87.4% of the K₂O. Mixed fertilizers were accountable for 36.8, 82.3, and 90.1% of the increases in consumption of these nutrients, respectively. The larger use of the six grades previously listed supplied approximately one-half of the increase in tonnages of these nutrients.

The weighted average of primary nutrients contained in mixed fertili-

TABLE 1—Fertilizers consumed as mixtures and as materials, year ended June 30, 1959, compared with previous year, by state and region¹ (Preliminary)

State and region	Mixtures 1,000 tons	Materials ² 1,000 tons	Total	
			Consumption 1,000 tons	Change from year ended June 30, 1958 1,000 tons
Maine	171	9	179	3/
New Hampshire	17	4	21	1
Vermont	46	30	76	8
Massachusetts	72	18	90	3
Rhode Island	13	2	15	-1
Connecticut	32	21	53	-3/
New England	375	73	449	18
New York	247	80	327	-9
New Jersey	813	26	839	83
Pennsylvania	245	74	319	17
Delaware	68	5	73	10
District of Columbia	4	1	5	1
Maryland	277	20	297	40
West Virginia	53	11	64	2
Middle Atlantic	1,722	217	1,939	86
Virginia	685	111	796	90
North Carolina	1,267	287	1,554	843
South Carolina	240	23	263	158
Georgia	1,151	317	1,468	250
Florida	1,023	178	1,201	4
South Atlantic	5,136	1,038	6,174	705
Ohio	277	113	390	36
Indiana	217	296	513	26
Illinois	618	268	886	89
Michigan	648	46	694	85
Wisconsin	116	28	144	21
East North Central	1,276	1,437	2,713	311
Minnesota	389	183	572	99
Iowa	434	281	715	133
Missouri	231	402	633	177
North Dakota	39	30	69	24
South Dakota	13	27	40	3
Nebraska	43	279	322	70
Kansas	2	126	128	21
West North Central	1,261	1,320	2,581	601
Kentucky	477	127	604	20
Tennessee	664	188	852	70
Alabama	882	273	1,155	128
Mississippi	202	380	582	59
East South Central	2,028	820	2,848	319
Arkansas	163	190	353	60
Louisiana	160	130	290	13
Oklahoma	71	61	132	97
Texas	220	374	594	-8
West South Central	685	777	1,462	100
Montana	4	38	42	3
Idaho	13	110	123	13
Wyoming	2	14	16	3
Colorado	14	72	86	4
New Mexico	3	38	41	3
Arizona	28	180	208	-28
Utah	5	42	47	7
Nevada	2	4	6	-13
Mountain	71	443	514	5
Washington	47	195	242	-5
Oregon	33	168	201	8
California	311	2,827	3,138	416
Pacific	811	2,618	3,429	419
Total	15,655	9,105	24,760	2,600
Hawaii	54	84	138	16
Puerto Rico	212	31	243	11
United States: 1958-59	15,901	9,888	25,789	2,607
1957-58	14,353	8,163	22,516	0
1956-57	14,703	8,006	22,709	193

1/ Due to rounding, column or cross totals may not balance. 2/ Includes: ground phosphate rock and colloidal phosphate, basic slag, secondary and trace nutrient materials, as boron, molybdenum, sulfur, gypsum, etc., used as separate materials. Does not include liming materials or the quantity of materials used in manufacture of commercial mixtures. 3/ Less than 900 tons. 4/ Includes an estimated 270,000 tons of dried manures. 5/ Includes materials not guaranteed to contain N, P₂O₅, or K₂O, amounting to 1,214,000 tons in 1958-59, 779,728 tons in 1957-58, and 943,243 tons in 1956-57.

TABLE 2—Principal grades of mixtures consumed in United States, year ended June 30, 1959¹ (Preliminary)

Grade	Consumption	Grade	Consumption	Grade	Consumption	Grade	Consumption
	1,000 tons		1,000 tons		1,000 tons		1,000 tons
0-10-20	89	4-8-10	83	5-20-20	980	8-12-12	72
0-14-14	199	4-8-12	145	6-4-8	64	8-16-16	199
0-20-20	284	4-9-3	52	6-6-6	90	8-24-8	53
2-12-12	302	4-10-6	121	6-8-6	104	8-32-0	60
3-9-9	461	4-10-7	306	6-8-8	253	10-6-4	78
3-9-18	85	4-12-8	102	6-10-4	87	10-10-10	748
3-9-27	59	4-12-12	1,228	6-12-6	67	10-20-10	212
3-12-6	71	4-16-16	448	6-12-12	478	12-12-12	889
3-12-12	615	5-10-5	450	6-24-12	222	14-0-14	63
4-7-5	92	5-10-10	1,624	6-24-24	162	14-4-10	70
4-8-6	62	5-10-15	340	8-4-8	53	Other ²	3,286
4-8-8	93	5-20-10	106	8-8-8	214	Total	15,921

1/ Grades consumed in amounts of 50,000 tons or more.

2/ Approximately 1,650 grades.

zers continued its upward trend. These averages were for nitrogen 6.20%; for available P_2O_5 , 12.76%; for K_2O , 11.94%; and for the total of these nutrients, 30.90%. The corresponding values in the preceding year were 5.96, 12.53, 11.73, and 30.22%.

Materials consumed for direct application represented: 62.7% of the nitrogen, 21.2% of the available P_2O_5 , and 12.6% of the K_2O . Increases in consumption of these nutrients accountable to materials were, respectively: 63.2, 17.7, and 9.9%. The combined increase in consumption of anhydrous ammonia, nitrogen solutions, and ammonium nitrate represented more than 80% of the increase in nitrogen consumed as direct application materials.

In the phosphate materials, the increase in consumption of the ammonium phosphates and superphosphates accounted for practically all of the increase in available P_2O_5 , and that of K_2O in the increase in use of potassium chloride.

Increases in primary nutrients accountable to both classes of fertilizers (mixtures and materials) were proportionate to their respective contents reflecting a general increase in consumption of all primary nutrients. The proportionate increase in consumption of primary nutrients in 1959 compared with 1958 was highest in those areas in which increases in planted acreage of cotton and corn were highest (West North Central) and lowest in those areas in which there was little change in planted acreage (New England).

New York State Considers Bills on Economic Poisons

By JOHN CIPPERLY

Croplife Washington Correspondent

WASHINGTON—The pesticide industry is watching legislative activity in New York State where bills are now pending to regulate use of economic poisons.

Officials of the National Agricultural Chemicals Assn. here report there is a bill pending concerning the labeling and registration of compounds in line with provisions of the Federal Act. This bill is receiving support of NAC officials who say such laws enacted by states will tend to introduce uniform control of economic poisons in all the states.

Such uniformity is now more important than ever, it is said, after such outbursts of authority as developed in the Food and Drug Administration during the 1959 holidays when FDA suddenly slapped down on the cranberry industry where a small segment of the industry allegedly had misused a weed-killer in crop production.

It is now seen that additional safeguards against misuse by individual farmers can be attained if state laws join to support FDA controls over residues of pesticidal chemicals in crop production.

CALIFORNIA OFFICERS

SACRAMENTO — The California Weed Conference, at its 12th annual meeting at Sacramento, Jan. 20, named Stanley S. Strew of Kentfield as its new president. Mr. Strew, sales manager, Colloidal Products Co., Sausalito, succeeds C. Bruce Wade, Shasta County agricultural commissioner. (Story in Feb. 1, Croplife, page 1.)

Other new officers are Dr. Oliver A. Leonard, associate botanist, botany department, University of California, Davis, vice president; William Hopkins of Santa Clara, technical representative, Amchem Products Corp., Niles, secretary, and Charles C. Siebe, district supervisor of rodent and weed control, California Department of Agriculture, LaPuente, treasurer.

TABLE 3—Kinds of fertilizers consumed, year ended June 30, 1959, by regions, In 1,000 tons¹ (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii and Puerto Rico	Total Consumption	Change from year ended June 30, 1958
MIXTURES	176	1,722	2,136	3,975	1,523	2,022	695	73	415	266	13,921	1,460
CHEMICAL NITROGEN MATERIALS	18	76	879	140	591	371	173	269	267	83	4,433	276
Ammonia, anhydrous	0	3	29	80	170	61	146	45	140	1	676	93
Ammonia, aqueous	2/	2/	0	7	1	2/	7	25	359	49	448	83
Ammonium nitrate/	5	30	164	160	332	290	122	77	94	0	1,273	196
Ammonium nitrate-limestone mixtures	2/	2	252	2/	38	3	3	2/	280	27	299	35
Ammonium sulfate	2/	9	7	117	14	13	25	10	60	0	318	154
Nitrogen solutions	1	6	151	93	130	15	25	10	2/	2/	407	31
Sodium nitrate	2	11	290	1	2/	145	27	2/	2/	2/	107	9
Urea	2	5	3	17	9	1	23	18	38	0	107	9
Other/	1	10	23	5	1	7	9	13	38	2/	108	-5
NATURAL ORGANIC MATERIALS	27	40	32	46	17	2	7	7	329	2/	507	13
Brind manure	9	13	6	6	4	1	3	2	272	2/	316	15
Seaweed sludge, all	6	17	9	29	7	1	2	4	49	2/	124	-10
Yuckage, all	3	8	6	1	2/	2/	2/	1	1	2/	19	1
Other/	9	3	11	10	6	2/	2	1	7	0	48	7
PHOSPHATE MATERIALS	32	86	126	698	630	251	234	106	278	17	2,548	184
Ammonium phosphate/	2/	1	1	31	183	3	106	86	144	2	547	78
Basic slag	0	0	21	0	0	117	3	0	0	0	140	-5
Calcium metaphosphate	0	1	1	6	23	16	2/	2/	2/	0	49	3
Phosphate rock and colloidal phosphate	2/	71	75	329	238	17	20	2/	2	4	835	-17
Superphosphate: 25% and under	2/	2	5	90	140	11	42	86	28	4	531	93
Over 25%	2/	2	3	2	2/	2/	3	8	15	2/	39	-2
POTASH MATERIALS	1	9	85	207	52	64	19	3	15	13	488	40
Potassium chloride	2	7	40	203	51	49	37	2	7	11	407	42
Other/	1	2	45	4	1	16	2	1	7	2	81	-2
PRIMARY NUTRIENT FERTILIZERS	449	2,009	6,250	9,007	2,923	2,940	1,439	288	1,983	380	23,917	2,353
SECONDARY & TRACE NUTRIENT MATERIALS	2/	4	116	4	3	4	3	28	1,050	3	1,214	274
Gypsum	2/	3	114	1	3/	3	2/	22	1,005	0	1,148	259
Other/	2/	1	2	3	2	1	3	6	45	3	66	15
NOT CLASSIFIED	0	3	0	2	7	0	0	0	0	0	12	---
ALL FERTILIZERS	449	2,016	6,374	9,013	2,933	2,944	1,442	296	3,033	383	25,143	2,627

1/ States comprising the regions are listed in Table 1. Due to rounding, totals of items may not add to column or class totals. 2/ Less than 500 tons. 3/ Undetermined quantities may have been used for non-fertilizer purposes. 4/ Includes quantities undesignated by kind. 5/ Includes all reported quantities of grades: 11-48; 11-50; 13-37; 14-20; 20-52; 21-53; and 27-14.

TABLE 4—Primary plant nutrients consumed in regions and United States as mixtures and as direct-application materials, by kinds, year ended June 30, 1959, in 1,000 tons¹ (Preliminary)

Kind	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Hawaii and Puerto Rico	United States
MIXTURES	29	105	251	288	129	101	56	10	45	33	987
MATERIALS	5	26	220	190	343	182	226	108	329	20	1,656
Ammonia, anhydrous	2/	0	3	24	66	140	50	120	37	115	555
Ammonia, aqueous	2/	---	---	0	2	---	---	1	5	71	90
Ammonium nitrate	2	10	55	54	112	96	41	26	32	0	430
Ammonium nitrate-limestone mixtures	---	---	---	---	---	8	1	1	---	0	62
Ammonium sulfate	---	2	2	24	3	3	17	12	48	6	117
Calcium cyanamide	---	2	2	---	---	2	2	---	2	0	9
Natural organics	1	2	2	2	1	---	---	---	6	---	14
Nitrogen solutions	---	2	38	31	57	4	8	3	14	0	157
Phosphate products	---	---	---	3	27	1	16	14	24	1	85
Potassium products	---	---	2	---	---	---	---	---	0	---	2
Sodium nitrate	---	2	40	---	---	23	9	---	---	---	75
Urea	1	2	1	8	2	1	10	8	13	3	49
Other chemical nitrogen products	---	1	2	1	---	---	---	2	5	---	11
Total nitrogen	34	131	471	418	472	290	282	118	374	53	2,643
MIXTURES	44	214	481	580	252	233	111	13	47	16	2,031
MATERIALS	7	18	23	84	155	45	61	72	76	4	945
Ammonium phosphates	---	0	---	10	60	1	27	25	35	2	160
Basic slag	0	0	2	0	0	10	---	0	0	0	12
Calcium metaphosphate	0	---	2	4	14	10	---	---	---	0	30
Natural organics	1	1	1	1	1	---	---	---	6	---	11
Phosphate rock and colloidal phosphate/	---	---	1	16	7	---	1	---	---	---	25
Superphosphate: 25% and under	6	15	15	10	9	17	13	3	17	1	105
Over 25%	---	1	3	42	65	5	19	39	12	2	187
Other phosphate products	1	1	1	---	---	---	1	5	6	---	16
Total available P_2O_5	51	232	504	664	447	278	172	85	123	20	2,576
MIXTURES	46	196	354	546	194	227	73	3	30	33	1,902
MATERIALS	2	5	31	126	31	33	23	2	15	7	275
Natural organics	---	---	---	1	---	---	---	---	8	---	10
Potassium chloride	1	4	24	124	31	29	22	1	4	7	247
Other potassium products	---	1	7	1	---	4	1	---	3	1	19
Total K_2O	48	201	385	672	225	260	96	5	45	40	2,177
GRAND TOTAL: N, avail. P_2O_5, K_2O											
1958-59	133	564	1,560	1,754	1,144	888	550	208	542	113	7,396
1957-58	129	539	1,366	1,569	886	726	497	196	501	103	6,512
1956-57	125	536	1,386	1,495	819	786	477	163	452	138	6,377

1/ States comprising the regions are listed in table 1. Due to rounding, totals of items may not add to column or class totals.

2/ Dashes (---) represent quantities less than 500 tons.

3/ Represents 2 percent of the colloidal phosphate and 3 percent of the phosphate rock.

CONFERENCE

(Continued from page 1)

from chemicals in food that may be harmful."

The Seattle district FDA chief emphasized that the law does not give the food and drug administration authority to "ban" or prohibit use of a specific pesticide . . . but, he said, the agency does have the authority to set tolerance at zero when it considers this necessary to protect consumers.

Pacific Northwest tree fruit growers were served notice by Mr. Monfore that the FDA believes that in the light of the dramatic episode involving cranberries and aminotriazole, there is a need for growers to take a good look at all pesticides. In his opinion, he said, 2,4,5-TP (2,4,5-Trichlorophenoxypropionic acid) needs special consideration.

"We have learned recently that this synthetic plant growth substance has been recommended and used in the Pacific Northwest on apples, prunes and apricots, but has not yet established any tolerance for this chemical," Mr. Monfore told the joint meeting. "If residues of this substance are found in or on raw agricultural commodities shipped in interstate commerce we will have no choice but to consider them adulterated and then apply the sanctions of the act."

That the FDA has a problem in connection with tolerances established for heptachlor was admitted by Mr. Monfore during his Portland talk.

"Tolerances of 0.1 part per mil-

lion have been established for heptachlor on 34 crops including fruits, vegetables, grains and forage. These tolerances were established on the basis of evidence presented in pesticide petitions which purported to show that residues would consist of heptachlor and this compound at the tolerance level would not deposit in the milk of cows consuming treated grain or forage," he pointed out.

He then emphasized the need for accurately identifying residues from pesticide application by pointing out that residues of heptachlor on forage crops convert to heptachlor epoxide which appears in milk when present in the ration of dairy cows.

"Long term tests to establish the safety of combined residues of heptachlor and epoxide have just been completed," Mr. Monfore told the gathering. "These studies will need to be evaluated before a conclusion can be reached on the safety of the total heptachlor and heptachlor epoxide residues."

Another speaker during the joint session of the three technical groups, Dr. Emery Burgess of the U.S. Department of Agriculture's agricultural research service, Washington, D.C., stressed the need for early detection of plant pests.

"It is a great deal easier to deal with them in a small area rather than have to fight them in large areas throughout the country," Dr. Burgess said.

This USDA official also empha-

sized that those in control and regulatory work are very dependent upon research workers for progress and that "the day is not yet in sight when agriculture can do without chemicals and we have to look towards our research friends for development of new controls."

Lin Harris, Portland district sales manager for Chipman Chemical Co., was named chairman of the Northwest Agricultural Chemicals Industry conference to succeed John T. Coke of the Naugatuck chemical division of U.S. Rubber Co.

Roland W. Portman, Moscow, Idaho, University of Idaho extension entomologist, was named chairman of the 19th annual Pacific Northwest Vegetable Insect conference to succeed Charles Doucette, Sumner, Wash., USDA research entomologist. The group's new vice president is Paul M. Elde, Mount Vernon, of the Northwest Washington experiment station, while Howard E. Dorst, Logan, Utah, USDA research entomologist, was re-elected secretary-treasurer.

Floyd Ellertson, Hood River, Oregon State College branch experiment station, was elected new chairman of the 34th annual Western Cooperative Spray project to succeed Ralph Downing, Summerlin, B.C., Canadian department of agriculture entomologist.

Others officers of this technical group are E. W. Anthon, Wenatchee, Wash., entomologist for the tree fruit experiment station there, chairman elect, and Anton Horn, Boise, University of Idaho entomologist, secretary-treasurer.

Entomologists in attendance at the Western Cooperative Spray project conference and the Pacific Northwest Vegetable Insect conference received an explanation of the U.S. Department of Agriculture's stepped-up insect detection program.

They were told that three insect detection workshops have been scheduled for March. Invited to attend these are all persons interested in insect pest detection including members of college research and extension staffs, state and county departments of agriculture, industry and members of the USDA's plant pest control division.

The Pacific Northwest workshop will be held March 14 through 15 at the county services building at Walla Walla, Wash., for Oregon, Washington and Idaho workers.

California, Arizona and Nevada entomologists will hold their workshop March 17 and 18 in the faculty club auditorium of the citrus experiment station at Riverside, Cal.

An insect detection workshop for

Montana, Wyoming, Utah, Colorado and New Mexico entomologists and qualified field workers will be held March 21 and 22 at the Farmers Union building at Denver, Colo.

Jack Holland, Portland, field sales representative for the American Cyanamid Corp., was named the first "Northwest Agricultural Chemical Man of the Year" during the 7th annual Northwest Agricultural Chemicals Industry conference at Portland.

Mr. Holland, whose territory covers Oregon, northern California, southern Idaho and northern Utah, won over 22 nominees out of the group's 40 members, reported John Coke, Portland, of the Naugatuck Chemical division of U.S. Rubber Co., the 1960 conference chairman who had the idea for such an award.

This year's Man of the Year judges were Robert Eickman, Portland, Stauffer Chemical Co., district manager; Lin Harris, Portland, Chipman Chemical Co., district manager; Harold Madsen, Portland, California Spray Chemicals' district manager; Keith Sime, Portland, Miller Products Co., sales manager, and George Kitzmiller, Pacific Cooperatives chemical division sales manager.

"It is time that those in the chemical business publicize positive benefits of the industry," declared Mr. Sime in his talk on "Pesticides—Boon to Mankind."

He pointed out that an estimated 5 million lives have been saved and 100 million sicknesses prevented through the use of chemicals that have controlled carriers of malaria and other contagious diseases.

Other agricultural chemicals industry conference speakers included Allen Baker, Olympia, Wash., supervisor of the Washington state department of agriculture grain and chemicals division; Roy Miller, Portland, Miller Products Co.; George Weidon, Berkeley, Cal., Western Agricultural Chemicals Assn. president, and Carl Johansen, Pullman, Wash., Washington State University entomologist.

Dr. R. E. Glasser, New York City, Shell Chemical Corp.; Dr. R. R. Legault, Pullman, Wash., Washington State University department of agricultural chemistry chairman; Dr. Virgil Freed, Corvallis, Ore., associate chemist, Oregon State College department of agricultural chemistry; Graham Randall, North Portland, technical representative for Stauffer Chemical Co., and Dr. Horace Telford, Pullman, Wash., Washington State University department of entomology chairman.

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Control of Vegetable Pests Described as Western Group Conducts Spray Conference

PORTLAND, ORE.—Various observations and progress reports relative to insect and disease control methods that some day may save Western states orchardists and vegetable producers millions of dollars were given by scores of researchers during the 34th annual Western Cooperative Spray project and the 19th annual Pacific Northwest Vegetable Insect conference here during the week ended Jan. 23.

It was emphasized that the reports are not intended in any way to constitute conference recommendations as these can be made only by public service entomologists from their respective areas.

Everett C. Burts of the Wenatchee, Wash., tree fruit experiment station, told the spray project gathering that

Sevin and Dilan applied in the cluster bud state gave the most satisfactory pear psylla control of materials tested in the pre-bloom period.

Mr. Burts also revealed that Guthion and Dilan gave outstanding pear psylla control during summer tests while Ethyl Trithion was also effective in the control of this insect during limited tests.

He also indicated that Guthion, Phosdrin, Di Brom and Methyl Ethyl Trithion were the most effective of materials tested for control of adult pear psylla.

E. E. Ellertson, Hood River, Ore., of the Mid-Columbia branch experiment station, told of results obtained when Anjou pear trees were given three covers of different sprays for control of codling moths. Two thou-



AT PACIFIC NORTHWEST CONFERENCE—Top photo: Trio elected at recent Portland meeting to lead Pacific Northwest Vegetable Insect conference during 1960, left to right: Roland Portman, University of Idaho entomologist, Moscow, chairman; Paul M. Elde, Northwest Washington experiment station, Mt. Vernon, Wash., vice chairman, and Howard E. Dorst, USDA research entomologist, Logan, Utah, secretary-treasurer. Below, group of agricultural chemical industry representatives discuss the 34th annual Western Cooperative Spray project at Portland meeting. From left to right, they are: John Muehler, Union Carbide Corp., Yaldma, Wash., Northwest area representative; Gordon Batchelor, Allied Chemical Corp., Wenatchee, representative; R. D. Eichmann, Stauffer Chemical Co., North Portland, and C. R. Tanner, California Spray-Chemical Corp., Portland, Ore.

sand pears from each of three treatments were examined at harvest for stings, worms and spray injury.

Three covers of Sevin, 50% wettable powder at 2 lb. gave 100% control, with limited burn on the fringe of Bartlett foliage after the first cover in May, but was not exaggerated by the following two covers. Guthion of 25%, WP at 1.5 lb. to 100 gal. water applied as three cover sprays resulted in .05% stings and no worms.

Three cover sprays of Guthion E 18.1% at 1% lb. per 100 gal. water resulted in .10% stings and no worms, the researcher said.

Mr. Ellerton also told the spray project meeting that Kelthane 18.5%, WP at rate of 1.5 lb. to 100 gal. water or Tedion 25%, WP at the rate of 1 lb. to 100 gal. water continued to give control of European red mite on apples and pears.

He pointed out that they appear to also give results when combined with Sevin 50%, WP.

M. H. Brunson, Yakima, Wash., of the USDA entomology research division, explained the residual quality and comparative efficiency of several insecticides applied to orchard plots with a speed-type sprayer to control codling moth on apples were assayed biologically with codling moth.

Adults, eggs, and newly hatched larvae were exposed in the laboratory to residues on samples of leaves and twigs, and larvae to residues on apples taken from the plots each week for four weeks after the application of sprays on June 18 and five weeks after applications on July 20.

Materials showing good results from residual action included Guthion, Sevin, parathion, and DDT.

F. P. Dean, Yakima, Wash., of the USDA's entomology research division, reported that Yakima valley codling moth injury to fruit was less last season than during a number of past years.

"This is somewhat surprising because of the large population of overwintering larvae from the 1958 infestation," Mr. Dean said. "The reduced codling moth activity was mainly due to below-normal spring temperatures that persisted until late June, and the general use of more effective insecticides."

Plots in one of the test orchards consisted of eight single tree replicates sprayed three times by hand.

Compounds tested reduced infestation to less than 1% of wormy apples. Materials were Guthion, Sevin, DDT, parathion, Diazinon, and Ethion.

Louis G. Gentner, Medford, Ore., of the Southern Oregon experiment station, told the spray project that the spring delayed dormant application is very important in the Medford area for getting pear psylla control off to a good start.

Egg-laying by overwintering adults usually begins about the middle of February. These adults are killed by oil and organic phosphate materials. Therefore, the sooner after Feb. 15 that the delayed dormant application can be applied, the better the control, because adults are killed before many eggs are laid on the spurs. This also prevents egg-laying later in the opening blossom cluster where no protection is present, he said.

E. W. Anthon, Wenatchee, Wash., Washington State University tree fruit experiment station entomologist, reported that the green peach aphid in 1959 caused more damage in North Central Washington than at any other time during the past 12 years.

This season an extensive experimental testing program was conducted in which 17 materials and 50 combinations were tested for the control of this aphid.

Phosdrin, endrin or Thiodan gave satisfactory control when applied early in the season before the leaves are curled. Phosdrin, nicotine plus soap or nicotine plus oil gave good control of severe aphid infestations, he reported.

Paul M. Elde, Mount Vernon,

Wash., of the Northwestern Washington experiment station, explained that in 1956 a series of plots were treated with various chemicals to find one that would control the wood weevil, *Nemocastes incomptus*, a native species noted for being unaffected by the chlorinated hydrocarbon soil treatments in general use for the control of the *Brachyrhinus* group of strawberry weevils.

The plots became seriously infested in 1959 for the first time, and counts were made by sifting one square-foot sample from each plot.

Benzene hexachloride was the outstanding material for the control of this pest and no weevil grubs were found in any of the twelve plots at rates of 2, 4 and 8 lb. gamma isomer an acre, he said.

H. E. Morrison, Corvallis, Ore., Oregon State College entomologist, reported symphyliids continue to be one of Oregon's most important pests and have reduced some of the most

fertile soils into marginal land. New host plants in Oregon include fall seeded wheat and oats in Washington County and potatoes in Malheur County.

Since the recommended pesticide soil treatments frequently fail to give adequate crop protection, he said, most emphasis in symphyliid control has been with soil fumigants.

It has been established that good results will be obtained with soil fumigants if they are used in recommended amounts and are properly timed and applied with adequate machinery in a well prepared seed bed below the level of symphyliid concentration in the soil.

Kenneth E. Gibson, Twin Falls, Idaho, of the USDA entomology research division, reported that experiments with the timing of insecticide treatments against the western bean cutworm as a pest of beans in southern Idaho were carried out during the 1959 season. Applications were made

August 3, 10 and 17, the first being timed approximately 2 weeks after the first adult moths were caught in black-light traps.

The insecticides used were DDT dusts and sprays. Sevin was also used in one series of replicates in the final application, he said. Although there was an unusually heavy flight of adult moths, there was practically no damage in any of the plots.

APPOINTMENT ANNOUNCED

CATASAUQUA, PA.—The appointment of Robert M. Johnson as assistant manager of its foreign sales division was announced by officials of Fuller Co. Mr. Johnson will assume his new duties immediately. An administrative assistant within the Fuller organization for the past 10 years, Mr. Johnson, in his new post, will be responsible for coordination of foreign sales effort.

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RESEARCH

(Continued from page 1)

vide food for a population of over 300 million people—and this on less land."

"This places a tremendous responsibility on our farmers and ranchers as well as others connected with agriculture. It also calls for a vast amount of cooperation among all segments of agriculture," Dr. Black said.

Dr. Stuart R. Race of NMSU's department of botany and entomology was optimistic over first-year results of a cotton insect control experiment begun in Deming, N.M., in 1959. Insecticides tested were toxaphene, parathion, DDT, endrin, malathion, sevin and Guthion. Early season thrips were satisfactorily controlled with each insecticide. The few lygus bugs, stinkbugs, bollworms, and loopers which were present also seemed to be satisfactorily controlled. The experiment will be continued during 1960, he stated.

Current research in cotton seedling disease control with chemicals is also showing promising results, according to Dr. C. R. Maier with the NMSU botany and entomology department. Soil treatment by any one of four

methods—in-the-furrow spray, in-the-furrow dust, soil fumigation, or plant box dry powder—appears to be the more promising method of application, Dr. Maier stated.

Dr. B. C. Williams, agronomist with the NMSU Experiment Station, said results of a recent study on fertilizers showed that the residual effect of fertilizers was pronounced after application of 160 and 320 lb. an acre nitrogen alone or in combination with phosphorus and/or potassium. On a year-by-year basis, results also showed that to obtain good yields on sandy land, rates of fertilizer higher than normally applied must be used. The need for phosphorus is exceptionally high in the plains areas of eastern New Mexico, he added.

At the short course, Jan. 14, Dr. R. A. Fisher, research entomologist with the California Spray-Chemical Corp., discussed mite control with 200 fruit growers. He said: "In apple orchards, mites are capable of developing resistance to chemicals. Some studies have shown that once resistance has developed it may be retained for years. Resistance may also develop more rapidly if minimal applications are made. You should, therefore, be certain that when you apply a mite spray, that you do a thorough job. Some people think that resist-

ance might be delayed by alternate use of different chemicals."

At the final day's sessions, Jan. 15, 200 vegetable growers were urged to take advantage of modern research to improve the quality and consumer appeal of their products to remain competitive with the entire food industry. The speaker, Dr. Will M. Simmons, agricultural economic statistician of Washington, D.C., said the prospect for vegetables in New Mexico will depend upon the ability and willingness of growers and handlers to give large buyers the product; volume, quality, and the service they want. He added that growers in New Mexico have demonstrated that the state can produce good quality vegetables and can obtain high yields, pointing specifically to onions, lettuce and carrots.

DIVIDEND DECLARED

NEW YORK—The board of directors of American Potash & Chemical Corp. on Jan. 26 declared a quarterly dividend of 30¢ a share on the common stock, \$1 a share on the \$4 cumulative preferred stock, series A, and \$1.25 a share on the special preferred stock. The dividends are payable March 15 to shareholders of record March 1.

SPRAY STUDY

SPOKANE, WASH.—Spray study work by the Washington State Department of Game will be confined entirely to field reconnaissance of various sprayed crops to see what the wildlife losses are.

This was the statement of J. Burton Lauckhart, chief of the department's game management division.

Mr. Lauckhart said that areas where different kinds and brands of sprays are used would be checked.

"We want to be able to advise interested farmers as to what sprays are safest from the standpoint of protecting birds and animals," Mr. Lauckhart said.

"The federal government, the colleges and universities, and the private companies are spending millions on controlled spray experiments. We can hardly keep up with the work that is being done by these scientific organizations."

400 Expected At Oregon Meeting

CORVALLIS, ORE. — Four hundred persons are expected to attend a one day conference on use of agricultural chemicals at Oregon State College Thursday, Feb. 11 under joint sponsorship of the college and the State Department of Agriculture. The session will open at 9:30 a.m. in the Home Economics building.

The conference is an outgrowth of recent developments in the spray residue field and will attempt to bring present knowledge on the subject into focus for Oregon people.

Originally designed for ground and air applicators of farm sprays and dusts, the meeting has been expanded to include representatives of country courts, garden clubs, processors, chemical companies, county agents and farm, labor and consumer organizations.

F. E. Price, dean of agriculture at the college, and Frank McKennon, director of agriculture, will chairmen the morning and afternoon sessions, respectively.

Virgil Freed of the state college staff will keynote the session with an opening address on "The Importance of Chemicals to Agriculture."

Other speakers will discuss pesticides from the standpoints of industry, governmental regulations and public health.

State and federal laws relating to all agricultural chemicals, clearance under the federal regulations and labeling requirements will highlight the afternoon program.

Peanut Fertilization, Insect Control Discussed

TIFFON, GA.—Fertilization, insect and disease control and other phases of peanut production were discussed at length by agricultural specialists at the "Peanut Production" short course at Abraham Baldwin Agricultural College in mid-January. Dean T. M. Cordell had charge of the program.

Current fertilizer recommendations are for about 400 lb. 4-12-12, or for 5-10-15 if potash is low in the soil. The best way to determine fertilizer needs is through a soil test. The soil test also shows need for lime, which is often necessary. S. A. Parham, agronomist at the Abraham Baldwin Agricultural College, said the pH level should not be driven below 6.4. Mr. Parham said gypsum is always needed on large-podded peanuts, and sometimes on Spanish and small seed runners.

Fungi and other diseases can cause 30 percent cut in peanut yield unless they are controlled, Dr. L. W. Boyle, of the Georgia Experiment Station, said. Among the fungus diseases he listed were Southern blight, root rot, peg rot, white mold and stem blight. "These are confusing until it is realized that they are all the same thing," Dr. Boyle said.

Books on Pesticides

THE GARDENER'S BUG BOOK (1956)

Dr. Cynthia Westcott

The Complete Handbook of Garden Pests and their control. Information, scientifically accurate but easy to read on 1,100 insects, mites and other animal pests that attack trees, shrubs, vines, lawns, flowers, fruits and vegetables in home gardens. Illustrations in full color. Control measures combine the latest in chemical developments with time-honored cultural measures. Helpful to all who serve the general public and to truck farmers and fruit gardeners. \$7.50

HANDBOOK OF AGRICULTURAL CHEMICALS—Second Edition

Lester W. Hanna, Agricultural Enterprises, Forest Grove, Ore.

As the title implies, this book contains broad information and tables on not only the chemical products themselves, but also on toxicity, residues, registration, terminology and emergency treatments. A fold-out chart gives compatibility data on numerous materials for formulators. Information on fertilizers includes soil elements, trace minerals, and application techniques. Descriptive material is also presented on fumigants, fungicides, herbicides, systemic, growth modifiers, livestock chemicals, rodenticides, and antibiotics. Information on materials and techniques is written fully with illustrations and tables. 490 pages. \$5.95

INSECT PESTS OF FARM, GARDEN and ORCHARD—Fifth Edition (1956)

Leonard M. Peairs and Ralph H. Davidson

A standard text for 44 years. Includes insects affecting grasses, grains, cotton, legumes, vegetables, flowers, fruits, stored products, household goods and domestic animals. Contains a new chapter on insecticide formulations, spray mixtures, application equipment, etc. Material on forty new pest species added, including drastic changes in the illustration. 661 pages. \$8.50

DDT and NEWER PERSISTENT INSECTICIDES

T. F. West and G. A. Campbell

The first and major part of book is devoted to the physical and chemical properties, manufacture, formulation and applications of DDT. The second part deals with other chlorinated hydrocarbons whose insecticidal properties have been discovered recently and compares these new insecticides with DDT. The preparation of aqueous suspensions, solutions, emulsions, and dusts containing DDT, the compatibility of DDT with other insecticides, fungicides and antibiotics are covered in detail. Contains dozens of tables on the solubility of DDT in various solvents, the catalytic activity of accessory substances in the presence of DDT, analogues of DDT, the comparative toxicity, hydrolysis and solubility of DDT analogues, the toxicity of DDT for almost all important insects, etc. Many illustrations. \$8.50

PESTS OF STORED GRAIN AND GRAIN PRODUCTS

Richard T. Cotton, Stored Product Insect Section, U.S. Department of Agriculture, Washington, D.C.

Dr. Cotton's valuable book is full of practical up-to-date information on the problems of insect and rodent contamination. Some of the main topics covered are: methods of detecting contamination in cereal from rodents, birds and insects; prevention and control of insect infestation in grain; new methods of storage; methods of sanitation in grain storage and processing plants; the latest information on fumigation; heat sterilization; and protection of stored seed. This book is concise, readable, completely indexed and includes over 100 figures and illustrations. 364 pages, 8½x5½", photo offset, illustrated, cloth bound. \$4.00

METHODS OF TESTING CHEMICALS ON INSECTS—Vol. I

Harold H. Shepard, chief, Agricultural Chemicals Staff, Commodity Stabilization Service, U.S. Department of Agriculture, Washington, D.C.

This is Vol. I of a proposed three-volume study. It describes methods of studying the effects of chemicals on the physiology of insects. Also covered are general techniques for applying chemicals to insects. It includes laboratory screening methods for determining the killing efficiency of insecticidal sprays, dusts and fumigants. Its 14 chapters are authored by prominent entomologists from USDA and State Experiment Stations. 355 pages; 8½x5½" photo-offset, cloth bound. \$5.00

THE CHEMISTRY AND ACTION OF INSECTICIDES

Harold H. Shepard, Entomologist, U.S. Department of Agriculture, formerly Associate Professor of Insect Toxicology, Cornell University.

Treats the chemistry of insecticides, the history of their use, their commercial importance here and abroad, the nature of the major uses, the influence of environment on effectiveness. Materials are arranged according to their chemical relationships. Two chapters relating to organic compounds largely new as insecticides. Illustrative data in form of tables, and a convenient appendix of equivalents arranged for practical use in the field. 504 pages. \$10.50

ADVANCES IN PEST CONTROL RESEARCH—Vol. 2

Edited by R. L. Metcalf, University of California, Citrus Experiment Station, Riverside, Cal.

This book, an annual series, treats pest control as a distinct discipline, discussing chemical, physical and biological methods from the common viewpoint of the basic principles involved and applying them to the control of weeds, fungi, bacteria, insects—all organisms which compete with man for his food supply, damage his possessions, or affect his person. Each annual volume contains chapters contributed by outstanding scientists having intimate knowledge of various pertinent topics within the field, presenting not only comprehensive reviews of recent advances but also critical evaluation of new developments and concepts. This volume continues the same plan which won immediate acceptance for the series. In eight chapters, a group of experts present and interpret recent advances in subjects ranging from the innate toxicity of fungicides to isotope dilution techniques and the spread of insecticide resistance. 1958; 434 pages, 110 illustrations, 43 tables. \$12.50

INSECT, FUNGUS AND WEED CONTROL

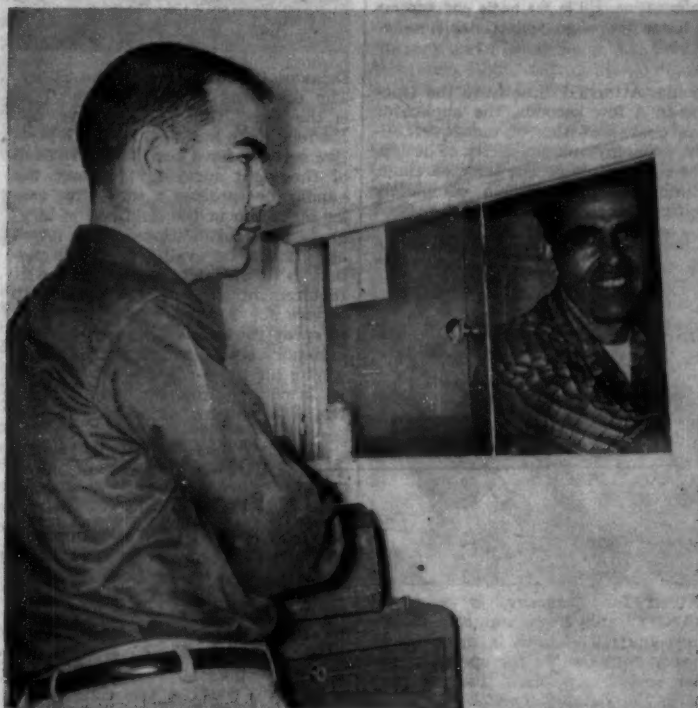
Dr. E. R. de Ong

The information is grouped according to field of application rather than to chemical composition or nomenclature. Chapters on insecticide label, seed disinfectants, herbicides, forest insects and diseases, livestock insects, and the pests found in household and industry. Fumigation of warehouses, residual sprays and preservatives for fruits, vegetables and wood products are covered. An up-to-date guide on pest control with the needs of operators, agricultural and structural specialists carefully considered. Shoppers and warehouse personnel will find the book useful. \$10.00

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TEAM WORK is used by Lindsay Proctor (left), owner of Proctor's Seed and Feed Co., Forrest City, Ark., and Kirby Herrod, the firm's technical representative, to make an effective farm service team.

In Forrest City, Arkansas . . .

'Shoe-String' Start Develops Into Booming Annual Gross

By **ED WHITE**
and **EMMETT ROBINSON**
CropLife Special Writers

Three years ago Lindsay Proctor had 3,500 borrowed dollars and an idea. Today he's operating a booming farm supply business which grosses well into six figures annually.

How has this former seed salesman built a thriving business in so short a time? "Service and quality," Mr. Proctor says. "You have to give the farmer service when he needs it and you have to stand behind the quality of the products you sell."

One example of the services offered at Proctor's Seed and Feed Co., 239 West Broadway, Forrest City, Ark., is that of cotton insect scouting. Last summer Mr. Proctor hired Kirby Herrod, a recent graduate of the University of Arkansas' College of Agriculture, as his technical representative. Mr. Herrod personally supervised

the scouting of some 15,000 acres of cotton and set up insecticide application schedules for company customers. When "hot spots" of insect outbreaks appeared, Mr. Herrod rode herd on the outbreaks until they were brought under control.

Mr. Proctor says, "This increased my insecticide business considerably over 1958 although 1959 was a comparatively light boll weevil year. I think we saved our customers money because they were able to use their insecticides more effectively. Many of them made two or three fewer applications than they normally do but still my volume increased because I was able to attract more customers."

Agricultural chemicals account for about 40% of Proctor's sales with the rest divided between feed and seed. He handles Olin Mathieson fertilizers; Stauffer, Chapman and Atlas agricultural chemicals;

(Turn to **BOOMING**, page 12)

Custom Application, Field Service Build Annual Fertilizer Business For New Mexico Company

By **JESS BLAIR**
CropLife Special Writer

Located in an area where fertilizer dealers have faced tough competition from itinerant truckers, Sacra Brothers of Roswell, N.M., have been increasing their business every year. Ordinarily they will sell liquid nitrogen and phosphates to cover nearly 10,000 acres of alfalfa, small grain and cotton land yearly.

A large part of this is applied by the company, which has six large pull-type rigs that are rented to farmers and also three tractor rigs which belong to Sacra Brothers.

"We figure the rental costs of the pull-type applicators in price of the liquid fertilizer," explained Harlan Williams, company man-

ager. "Usually it is enough to pay for the upkeep and depreciation of the machinery."

Mr. Williams says the firm prefers to apply the fertilizer because the experienced employees can usually do a better job. These applicators are large enough to cover four rows of cotton or a 166-in. span on small grain and alfalfa.

The man in charge of field application shuttles from one job to another, but keeps in touch with the office by radio, which is used on all company trucks and pick-ups. This type of communication eliminates wasted motion, and often enables the drivers to do a rush job which may be in their area.

"We don't solicit small fields," said

Mr. Williams, "but we never turn one down, though. Usually we wait until we have another job in that vicinity, then go by and apply the fertilizer on the small field. For very small fields, we put the fertilizer in the irrigation water."

The company has one tractor with dual applicators which is used for applying both liquid and dry fertilizer at the same time. The two main fertilizers used in this area are anhydrous ammonia and a dry phosphate.

When a farmer rents an applicator, the company sends an employee out to help get it started. This is a very important part of the rental system, said Mr. Williams. Ordinarily the

farmer won't know much about such equipment and needs help getting started.

"It saves wear and tear on machinery," said the manager, "but it also means a better job. We make sure the regulators are properly set. Our first concern is with results. We don't want that customer using too much or too little of the materials, because it will be reflected in his yields."

Sacra Brothers have been through many price wars on fertilizer, but have never cut prices below a profitable margin.

"We lose a customer sometimes," said Mr. Williams, "but practically all

(Turn to **CUSTOM**, page 14)



SHOWN ABOVE is some of the fertilizer spreading equipment owned by Sacra Brothers, Roswell, N.M.

WHAT'S NEW

IN PRODUCTS • SERVICES • LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 6014—9 Applicator Models

Gandy Co. has announced the introduction of nine new models to its 1960 line of granular chemical applicators for soil insect and/or weed control. The company has 12 models now, including units to fit any planting equipment, lister, cultivator or tool bar. Newly incorporated features include an improved rate-control me-



tering system, a weather-tight hopper, a new mounting bracket, heavy duty stabilizer braces adjustable to fit all planters, a new drive sprocket, and a new distribution tube assembly. For more information, check No. 6014 on the coupon and mail.

No. 6015—Systemic Insecticide

A systemic insecticide that gives young cotton plants protection against a variety of insects has been placed on the market by Chemagro Corp. Called "Di-Syston," the product

has been registered for use by the U.S. Department of Agriculture. According to company literature, the product is effective against aphids, mites and thrips and is harmless to predators. It is applied to the ground in granular form at the same time the cotton seeds are planted. For more information, check No. 6015 on the coupon and mail.

No. 6016—Bulletin on Weed Killer

A bulletin containing information on the use of R-H Weed Rhap-20 in weeding corn fields, has been released by Reasor-Hill Corp. The colored, illustrated bulletin lists advantages of the product and has a step by step drawing showing the operational sequence using the product. A table shows the effects of various levels of weeds on corn yield. For copies, check No. 6016 on the coupon and mail to this publication.

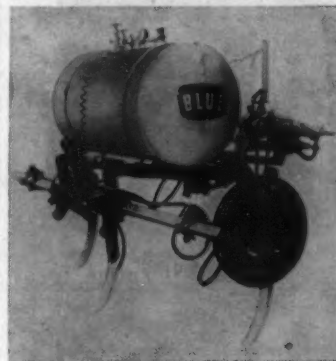
Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6012—Anhydrous Applicator

John Blue Co. announces a "Mono-Wheel" applicator for anhydrous am-

monia. Attached directly to the tractor in a few seconds, the applicator has characteristics of maneuverability, economy and simplicity of design, the company says. The tank, carriage, pump and drive are a completely self-contained unit. The pump, ground



driven for accuracy, is a model "ANDY" anhydrous ammonia metering pump. The tank is mounted on heavy duty saddles for operation under severe conditions, the company says. For details, check No. 6012 on the coupon and mail.

No. 6013—Spreader Bed Booklets

Fipps, Inc., has issued a booklet on the company's fertilizer, lime, phosphate spreader, featuring a complete description of the spreader bed. Features outlined in the booklet include the two-speed transmission, 19 ft.



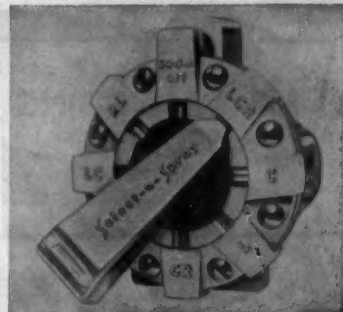
hoods, 20 in. single distributor fan, spinner case and speed reducer. The spreader bed featured is designed for maximum spreading coverage with a minimum of trips through the field. For copies of the booklet, check No. 6013 on the coupon and mail to this publication.

No. 6005—Sprayer, Duster Catalog

A 28-page illustrated catalog containing information about sprayers, dusters and allied products, has been released by Universal Metal Products Co., division of Air Control Products, Inc. The catalog contains information about operation of a number of company products, with specifications, illustrations and uses of each. For copies of the catalog, check No. 6005 on the coupon and mail to this publication.

No. 6006—Boom Control Valve

A boom control valve for pressures up to 300 psi has been added to the product line of the Delavan Manufacturing Co. It is being marketed under the trade designation of



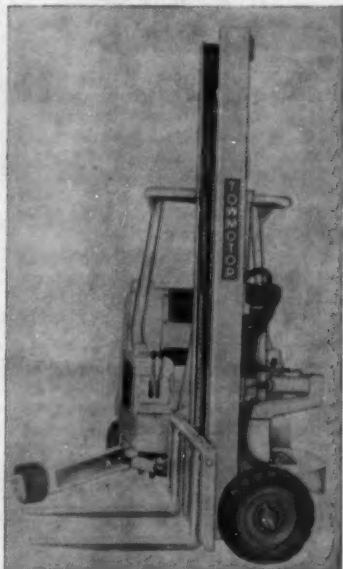
Delavan 9000 series Select-A-Spray. The operating principle of the unit is the same, the company says, but the face plate has been restyled, positive settings have been added to each of the eight spraying positions, the handle incorporates a spring for easier operation in the field and is larger to provide additional hand leverage. It will be available in four models to fit all inlet, bypass and outlet requirements. It comes with two cap screws for simple, sturdy mounting to spray rig and is furnished with an accessory outlet which is fitted with a plug for those cases where the outlet is not required. For details check No. 6006 on the coupon and mail.

No. 6007—Weed Killer Brochure

"Grow Strawberries for Profit" is the title of a publication released by Reasor-Hill Corp. discussing R-H Weed Rhap-20, a granular 2,4-D. The illustrated publication contains information on how to use the product to rid strawberries of weeds. Before and after photos are used. For copies, check No. 6007 on the coupon and mail.

No. 6010—Fork Lift Truck

Towmotor Corp. announces the model 590 fork lift truck in the company's "Narrow-Aisle-Stack" series. The entire front end assembly can be pivoted a full 90° in either direction. To right or left angle stack loads in an aisle as narrow as 6 ft.



The hydraulically-operated outriggers stabilize the unit during the pivoting operation. Wheelbase is 59 in. Capacity is 4,000 lb. at 24 in. load center. For details, check No. 6010 on the coupon and mail.

No. 6009—Insecticide Fog Generator

The Dyna-Fog "50," an insecticide fog generator, has been added to the Curtis Automotive Devices, Inc., line of insecticide dispensing equipment. It is designed primarily for indoor

Send me information on the items marked:

- | | |
|---|---|
| <input type="checkbox"/> No. 6005—Sprayer, Duster Catalog | <input type="checkbox"/> No. 6012—Anhydrous Applicator |
| <input type="checkbox"/> No. 6006—Boom Control Valve | <input type="checkbox"/> No. 6013—Spreader Bed Booklets |
| <input type="checkbox"/> No. 6007—Weed Killer Brochure | <input type="checkbox"/> No. 6014—New Applicator Models |
| <input type="checkbox"/> No. 6008—Mist Sprayer | <input type="checkbox"/> No. 6015—Systemic Insecticide |
| <input type="checkbox"/> No. 6009—Fog Generator | <input type="checkbox"/> No. 6016—Weed Killer Bulletin |
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applications, but can be used outside also, the company says. It produces a dense cloud of dry insecticide fog without residues, the company says. It weighs 16½ lb., it is portable, is 52 in. long and is constructed of stainless steel and aluminum. It is powered by a regular grade gasoline. For further information, check No. 6009 on the coupon and mail.

No. 6008—Air-type Mist Sprayer

The model 51 "Rotomist" has been introduced by the John Bean Division of Food Machinery & Chemical Corp. The air-type mist sprayer is designed especially for mosquito control. Features include a 21 in. axial flow fan and Hypo pump producing 15 gpm at 150 psi. The model is mounted on a 75 gal. tank, is manually rotated through 360° pivoted at the center of the base on six 3 in. steel rollers, and has a 35° angle discharge head available for spraying small to medium trees. It also has a



special fuel oil injecting system that emits smoke into the air stream to trace the spray pattern. Power is from a two cylinder, 13 h.p. air-cooled engine. For details, check No. 6008 on the coupon and mail.

Panogen Names Two Area Sales Representatives

CHICAGO—Warren K. Dulin and Byron R. Hodgkin have been named sales representatives for the Panogen Co., announced Dr. Raymond P. Seven, assistant general manager.

Mr. Dulin, formerly associated with the national Association of Manufacturers, will cover the West Texas-New Mexico area. He received his B.S. degree in agriculture from the University of Kentucky.

Mr. Hodgkin will assist Gene Crist, sales supervisor, in the Kansas, Oklahoma and Missouri areas. He was formerly with Babson Brothers Co., and received his B.S. degree from North Carolina State College.

STARLING PROGRAM

SALEM, ORE.—Oregon is reported to be making satisfactory progress in its starling control program.

Frank McKennon, director of agriculture, made this statement following a recent meeting of the over-all committee on predator control. Also represented on the committee are the U.S. Fish and Wildlife Service, the state game commission and the extension service.

Concentrations of this nuisance bird have been found in various places in parts of Oregon.

Holly growers, the committee reported, were able to harvest their crops without damage. Whether the starling control program had anything to do with this may remain a tongue-in-cheek question until someone proves that these birds can read. In any event, the birds didn't move onto the holly orchards until after harvest this past season!

Trade Winds From California

FRESNO, CAL.—Chemical Distributors has been incorporated here at a capitalization of \$75,000, to distribute various kinds of fertilizer products.

GILROY, CAL.—George G. and Eileen G. Bordenave have sold Grow's Nursery and Flower Shop, 333 South Monterey Blvd., Gilroy, to William J. and Jean E. Rivers.

SALINAS, CAL.—William I. and Lorine O. Henningsen have founded the Sunny Hills Nursery at 30 Calera Canyon Rd., Salinas, to retail farm chemicals for home use.

SHAFTER, CAL.—Shafter Farm Chemicals has been incorporated at \$50,000, and is involved in the sale

of various kinds of insecticides and chemical sprays. Directors of the firm include Carl Rush, Horace W. Putnam, and Howard T. Francis.

TURLOCK, CAL.—The B&L Co. in Turlock has been incorporated for the purpose of processing fertilizer and seed products. Principals in the firm include Annabelle Lytle, Anthony Bettencourt, and Roy P. Bethel. Stock is evaluated at \$75,000.

FRESNO, CAL.—The Asahi Nursery has been founded in Fresno by Masaro Nishioki and Sanger and Tom Ishimoto. The firm is capitalized at \$75,000.

SARATOGA, CAL.—Swain's Nursery, Saratoga, has been sold by its founders, G. D. and Hazel L. Swain to George F. and Sylvia Taylor. The store is located at 12415 South Saratoga-Sunnyvale Road.

STOCKTON, CAL.—The Mist Kill Co. has been incorporated in Stock-

ton to distribute insecticides. Principal owners of the firm include John W. Tatum and Robert E. Goins.

VALLEJO, CAL.—Eugene A. Thurber has opened Gene's Nursery at 344 Washington St., Vallejo.

MODESTO, CAL.—Country Home and Garden Supplies has been sold by Alvin L. Anderson and Theodore W. Seybold, former partners, to Donald C. Swanson. The store is at 1320 Yosemite Blvd., Modesto.

FRESNO, CAL.—A new nursery retailing farm chemicals to home gardeners has been granted a permit to operate on East Shaw Ave., near Mariposa Ave., Fresno. Owner is John Frech.

CLEARLAKE, CAL.—Richard D. and Etta M. Moore have opened the D and E Nursery store at Laudell Ave. and 40th Ave., Clearlake, retailing chemicals and related agricultural products.



Wherever you are in the West, you have ANCHOR in your own backyard!

CENTRALLY LOCATED PLANT

Western Phosphates, Inc., manufactures Anchor fertilizers at Garfield, Utah—a location that's ideal for serving dealers and manufacturers in any Western state.

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In-transit warehouses hold abundant stocks of Anchor fertilizers at many points throughout the West. Your orders can usually be filled from these convenient, local supplies.

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Wilson & Geo. Meyer & Co., Intermountain, sales agent for Anchor fertilizers, maintains 10 convenient offices in major Western agricultural areas. To order, just call or write the office nearest you.

Top-quality Anchor fertilizers now available for your formulations or for resale:

Anchor Treble Superphosphate 45%, pelleted—900 lbs. per ton of available, readily soluble phosphate.

Anchor Treble Superphosphate 45%, ammoniation grade—made for greater nitrogen absorption. High free-acid and moisture content.

Liquid Phosphoric Acid—suitable for soil or water application or for manufacturing complete fertilizers.

Anchor Ammonium Phosphates, pelleted—completely soluble phosphate in four combined analyses: 11-48-0, 16-20-0, 13-39-0, and 16-48-0.

New Anchor Ammonium Nitrate Phosphates are now available in many Western areas. Your Anchor representative can give you full details.

ANCHOR

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Produced by WESTERN PHOSPHATES, INC., Salt Lake City 10, Utah

Distributed by WILSON & GEO. MEYER & CO., INTERMOUNTAIN

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ATTRACTIVE displays of garden supplies and other allied lines are important factors in the increasing business of Proctor's Seed and Feed Co., Forrest City, Ark.

BOOMING

(Continued from page 9)

Karmex pre-emergent herbicide for cotton and Ful-O-Pep feeds.

Most of the advertising budget goes into radio because Mr. Proctor believes that too much of the local newspaper's circulation is concentrated within the Forrest City city limits. "People that are my potential customers do listen to radio," he says. "I am fortunate that we have a good radio station here."

Radio advertising is concentrated on a spot schedule at the rate of two or three a day in the 6:45 to 7 a.m. and 12 to 12:30 p.m. time slots.

Mr. Proctor believes that direct mail advertising may be even more effective and plans to expand this phase of his advertising. At the present time he uses "co-op" mailing pieces furnished by his suppliers. "I never turn down a chance to use them," he says.

Another wrinkle in direct mail is his own idea. When a customer hasn't placed an order over a 30-day period Mr. Proctor writes him a personal letter listing a few of the items the customer might be interested in. "We find this very effective," Mr. Proctor comments. "Of course we have to know quite a bit about his operation to suggest things he might need. But by going to this extra trouble of learning about a customer, we are in a better position to offer him better service."

The Proctor Seed and Feed Co. tries to transact business on a cash basis. "Most of our sales are cash," Mr. Proctor says, "although for a few approved credit customers, 30 day terms are arranged." By approved credit customers Mr. Proctor means those with whom he has had satisfactory credit arrangements previously. But even this 30 day arrangement represents a change for the Mississippi Delta area where credit traditionally has been from cotton planting time to cotton ginning time.

The lanky farm store operator took steps early in his business career to insure against customer credit getting out of hand. He hired an accountant to prepare a monthly profit and loss statement. "This way I am aware at all times of the exact state of my business. When my credit accounts begin to mount up I know about it right away and

I can take steps to prevent too much of my capital being tied up. If I'm going to stay in business, I have to get my money back in."

Mr. Proctor makes extensive use of credit available to him through one of the local banks. He not only borrowed the money there to start his business but he has established such a good record that he is able to obtain money to buy from suppliers at off season prices. This is one of the things he points to as the reason for the remarkable expansion of his business.

Looking to the future, Mr. Proctor can see only continued expansion of the farm supply business—especially in agricultural chemicals. "Take cotton production as an example," he will tell you. "It has changed tremendously in the past few years and it is going to change even more in the next five years. There doesn't seem to be much chance that the farmer can expect more money for his cotton so the man who learns to use more chemicals more effectively, and those who can completely mechanize their production methods, will be the ones who will be producing most of the cotton."

"My job," he continues, "is to keep myself in a position to supply these chemicals that he is going to need. Hiring a technical representative is only one of the steps I have taken to prepare for the future."

One thing that Mr. Proctor is most enthusiastic about is his line of allied products such as garden sprays and animal health products. "This seems to be a fast growing part of my business and I try to push it as hard as I can. The margin on these items is larger than on other lines so I can really help my profit picture here," he points out.

The company is open six days a week from seven in the morning until six in the evening. Mr. Proctor has a staff of five; two stock men, a bookkeeper-secretary, a technical representative and a clerk for inside sales.

Two months ago the company moved into a new 4,000 sq. ft. building on Forrest City's main street. The sales room measures 20 ft. by 40 ft. and is walled entirely by glass on one side. Already Mr. Proctor is planning a 1,200 sq. ft. warehouse addition. And he uses another 2,000 sq. ft. of warehouse space in another part of the city.

How does Mr. Proctor feel about



WELL-LIGHTED and well-arranged warehouse space helps Proctor's Seed and Feed Co. customers get their orders with a minimum of waiting. Here a worker brings another load.

competition? "I think it's a good thing," he says. "Good competition keeps everyone on their toes and helps build a reputation for your town as a good farm supply center. That helps everyone."

He points to his own town of Forrest City as a prime example. He has two vigorous competitors and the town is only 45 miles from Memphis. Yet Mr. Proctor draws customers that formerly traded with larger dealers in Memphis and east Arkansas cities. "Farmers are beginning to

realize that we do enough business to carry large stocks. Now they know that they don't have to go very far just to buy in quantity."

If he had to sum up a success formula in one word for operating a successful farm supply business, Mr. Proctor probably would select "reputation." "If you can build a business reputation of offering good products and good service, the customer will keep coming back to you," he said. "A business is only as good as its reputation."



PLENTY of parking space is available to customers at Proctor's Seed and Feed Co., Forrest City, Ark.



By Emmet J. Hoffman
Croplife Marketing Editor

OVER THE COUNTER

The dealers who give credit need to be astute credit managers. A well-conceived, workable and fair credit policy is the first requirement. Many, many successful dealers who have developed individual plans give testimony to this idea. Anyone who grants credit without a plan has one strike against him. A credit policy is not only recommended—it's essential.

The policy may not cover every situation at first. The plan can be changed. And what works best for one dealer may not be best for another. But credit plans usually have much in common.

A regional fertilizer manufacturing company official with extensive knowledge of dealer practices offers some sound suggestions. The suggestions are based on 25 years of working with the dealer system. Here is what he recommends to his dealers:

When the farmer asks the dealer for credit, the farmer is asked to sign a note bearing 8% interest. If the farmer comes back within 30 days to pay the fertilizer bill, the dealer gives the note back to be torn up. If the farmer doesn't come back within

30 days, the dealer isn't under obligation to go out to the farm to ask for a signature—an unpleasant chore if ever there was one.

Another advantage: The note becomes effective from the date of purchase if the farmer doesn't pay within 30 days and the dealer's money is earning interest immediately.

One more advantage: At the end of 30 days, the farmer may decide (while the dealer rejoices) to borrow bank money for 6½% or 7% interest to pay off the dealer. The farmer has had 30 days in which to pay his bill and this is certainly a reasonable period of time.

The fertilizer company official says that his dealers use an ordinary note and no security is demanded.

"Explain credit conditions clearly so that there will be absolutely no misunderstanding. Tell them all the details so later you don't have to go back red-faced to say, 'There's one thing we forgot to discuss.' The reason for a full explanation is obvious. Seeds of mistrust are sown in the farmer's mind by unpleasant discussions involving past due accounts. They can be largely avoided," says the fertilizer company official.

Credit is fine but the dealer must remember that a sale isn't complete until the money is in the cash register.



Her father asked his prospective son-in-law if he could support a family, and we have to admire the young man's answer—"No, sir, I was only planning to support your daughter. The rest of you will have to take care of yourselves."

Then there's the off-beat psychiatrist who advertises: "Satisfaction guaranteed or your mania back."

Teacher: Johnny, do you wish to leave the room?

Johnny: I ain't hitchhiking

The old engineer pulled up to the water tank and briefed the new flagman. The latter climbed on the tender and reached up to pull down the spout, but as he did his foot caught in the chain and he fell into the tank. As he floundered in the water the old hogger watched him with a jaundiced eye.

"Just fill the tank with water, sonny," he drawled. "No need to stamp the stuff down."

Discussing his tennis technique, a stout, amiable bald man panted:

"My brain immediately barks out a command to my body. 'Run forward speedily,' it says, 'Start right away! Slam the ball gracefully over the net, then walk slowly back!'"

"And then what happens?" he was asked.

"And then," replied the bald man, "my body says, 'Who, me?'"

Then there's the minister's calling card that reads: "What on earth are you doing for Heaven's sake?"

HIGH PRICED APPLE PESTS

COLUMBUS, OHIO—Insects and mites presented Ohio apple growers with a bill for \$1 million in 1959, Dr. C. R. Cutright, Ohio Agricultural Experiment Station entomologist states. This is the total amount due to direct loss from bugs plus that attributed to layout for spray chemicals, labor, fuel, etc., to control them.

The commercial crop of apples in Ohio last season was approximately three million bushels. About 5%, or 150,000 bu., was damaged by insects. Since many insect-damaged fruits can be salvaged for various uses, this is not a total loss. Nevertheless, actual loss, figuring damaged apples worth only a \$1 a bushel, runs \$150,000.

The cost of labor and materials adds up to another \$970,000, or a total cost due to insect and mites of \$1,120,000.

The insect that represents the most outlay for its control is the codling moth. Here is how apple growers apportioned their money last season for control of major pests: Codling moth, \$500,000; mites, \$200,000; plum curculio, \$100,000; red-banded leaf roller, \$45,000; others, \$25,000.

R. H. Hodgson Joins Raymond Bag Staff

MIDDLETOWN, OHIO.—R. H. Hodgson has joined the sales organization of Raymond Bag Corp., Middletown. He will represent Raymond in Georgia, and the surrounding areas, and will make his headquarters in Atlanta, Ga.

Mr. Hodgson, a graduate of University of Georgia, has had many years of experience in the multiwall bag business, having been associated formerly with Chemical Packaging Co. of Savannah, Ga., and Union Bag-Camp Paper Corp.

CHARTER GIVEN

OKLAHOMA CITY, OKLA.—Charter has been given O. K. Fertilizer Co., Guymon, Okla. with capital stock of \$20,000, 50 years existence. Incorporators are Worth Jeffus, William Lain and Winifred Jeffus, all of Guymon.



Swift's EXTRA MEASURE of Pesticide Quality...



What a beautiful sight when the harvest moves to market. And right now you can help assure hundreds of extra harvest dollars for your customers by stocking Gold Bear pesticides... weed killers—insecticides—fungicides. That's why Gold Bear belongs in this market picture.

Why Gold Bear? Two reasons: First—the ingredients—the finest of the old, and the tested of the new... all selected for quality, potency and life in storage.

Second—ever-watchful quality control of

every ingredient and process to assure your customers of trouble-free, uniform application and higher killing power with either liquids or dusts.

Find out what the Swift name and Gold Bear pesticides can do for your sales. Write on your letterhead to: SWIFT & COMPANY, Agricultural Chemical Division, Chicago 9, Illinois.

Swift
105TH YEAR

To Serve Your Industry Better



MAC DOLLAR says:

WHEN YOU'RE SELLING TO MAKE MONEY, SWIFT'S YOUR FINEST LINE!

SWIFT & COMPANY • Agricultural Chemical Division • Chicago 9, Illinois

SCHOENFELD AND McGILLICUDDY



OSCAR & PAT

By AL P. NELSON

When Oscar came back from lunch, he found a boy of about 16 standing inside the door, a sheaf of papers in hand. Something about the boy was familiar to Oscar. He peered at the fellow suspiciously, then his eyes widened.

"I know you!" he exclaimed. "You are the boy from the printer." Oscar's eyes strayed to the sheaf of papers. "What have you got there? Another of those crazy no-goot ads?"

Fear spread across the boy's face, and his lips moved. "I—I'm looking for Mr. McGillicuddy!" he stammered. "W—when will he be back?"

"We never know," Oscar snapped. "Gif me those papers."

"B—but they're for Mr. Pat!" pleaded the boy.

Oscar looked at the boy with steely stare. "Are those adt proofs?"

The boy looked miserable. "Y—yes."

"Then gif them to me," Oscar commanded. "I own half this company."

He reached out and took them from the boy's hand. Then he spread them out on the counter. "Mine Gott?" he exclaimed. "Another half page adt. Is that Irish crazy? Why doesn't he buy oudt the paper and run it by himself, he likes it so much?"

The boy's lips moved wordlessly, as he watched the irate Oscar.

"Himmel!" cried Oscar, "and now he's advertising the county agent. The Farmer Has Many Helpers and One of the Most Important Is the County Agent. Tillie!" Oscar turned angrily toward the plump ulcerish Tillie Mason, who sat typing. "Now he is boostin' the county agent. In a half page! Not one wordt does he say about our fertilizer. Is the county agent payink us for this?"

The misery of the printer's boy increased as he watched Oscar. "I will show him what I do with foolish adts like this!" Oscar roared. "Ach, I will tear it up like this."

Before the shocked gaze of the printer's boy, Oscar ripped the proofs into shreds and threw them in the wastebasket. "Go back andt tell your boss to cancel the adt!" he exclaimed. "Tell him he shouldt be ashamed to try to milk us of so much money each week. And he shouldn't try to charge us a setup price for the type. If he does, he neffer gets another adt, except over mine deadt body!"

With tears in his eyes and a groan on his lips, the printer's boy turned and ran out of the door. "There," said Oscar brushing his hands. "Ach, I safed money for the company. Lucky I got back from lunch just when that boy came looking for Pat."

At this moment, the door opened and a tall, grim faced Pat walked in. There was fire in his blue eyes. He strode to Oscar's desk and yelled: "What's the idea, Deutscher, tearing up proofs of my adt?"

"Ach, I tear up anything that is foolish and that costs us extra money!" Oscar thundered. "Foolish adts. Foolish Irisher, yah?"

The cords on Pat's lean neck stuck out like a gorged rooster's. "You've been tearing up too many proofs of ads, letterheads and circulars to suit me!" he snapped. "Who do you think you are around here—an autocrat? Well, there are some things that you do I think are mighty foolish."

Then, before Oscar could protest, Pat picked up a stack of discounted bills and quickly ripped them into shreds. As horrified Oscar was frozen into momentary silence, Pat

flung the mess into the wastebasket and then spit into it. His one arm reached out and grabbed the green bulldog paper clip receptacle and dumped its contents into the wastebasket.

"That's where I ought to dump you in, too, you short-sighted penny pincher!" he roared. "I've had just about enough of you."

"Schpendter!" Oscar hissed.

"Miser!" glowered Pat.

Silence reigned but sparks flew blue, purple and white between their eyes. Finally Pat said, "Now we know what we think of each other 100%. Now you listen to my side of the story—for once."

"You ain't got no story!" Oscar

shouted hoarsely. "You got holes in all your pockets, ach, and in your headt, too."

"This is the best publicity idea we've had in a long time—this good-will series," Pat said in a loud voice. "I am going to play up a farmer's helper every week. First the county agent, then the extension workers and county home agent, then the banks that lend the farmer money, then the schools that have ag classes, and then the fertilizer dealers like us. All these people are trying to help the farmer."

"And he don't pay nobody!" yelled Oscar. "The more he gets the more he charges what he buys and takes months to pay."

"The county agent talks on radio

and TV," Pat pointed out icily. "He tells farmers to take care of their land, to fertilize properly, to spray for weeds and insects. He's a booster for our business, Oscar. We should boost his work now and then, like I'm doing in this ad. We should also boost the work of the 4-H, the FFA, the extension workers and others. That builds goodwill. These people can recommend our products and that farmers trade with us—indirectly, of course."

"Foolish! Foolish!" shrieked Oscar. "Are all Irishers as crazy as you? Are they all big schpendters like you?"

"Most of them are, thank heavens!" Pat snapped. "If everybody pinched pennies like you do, business would never grow, farmers would cultivate soil with no fertilizer on it and get poor crops. Insects would eat all the corn and garden produce. In my estimation misers like you are worse than skunks—"

And so it went on.



THIS TRACTOR, owned by Sacra Brothers, Roswell, N.M., is equipped for dual application of liquid nitrogen and dry phosphates. The company has sponsored winter application programs, and now finds January, February

and March as the busiest months. The man on the ground is inspecting the soil to determine if conditions are right for the most effective application.

CUSTOM

(Continued from page 9)

of them come back. Last year a farmer bought from an outside company for a lower price but he paid for 173 lb. per acre. At the six cent lower price this ran much more than our recommended application of 100 lb. per acre. His yield was not 1 lb. more, because he used too much. Now he realizes this and has turned his 1960 fertilizer program over to us."

Mr. Williams says the company has been selling fertilizer for six years and plans to stay in business. This means selling the same customers over and over again. Because sales are tied in so closely to results, he has worked with all government agricultural agencies and the state college to learn just what is needed.

At present the state agricultural college has about 25 test plots in the Roswell area. Fertilizers of various kinds and amounts have been tried on field plots. From these tests and from hundreds of soil tests made, Mr. Williams knows what is needed to increase yields at the least cost.

He has been instrumental in get-

ting farmers to apply their fertilizer in the winter months. This required a bit of selling and a lot of experimental work, but now the biggest season for fertilizer sales is during January, February and early March.

"Usually the work goes fast," he said, "because crops are off and farmers have their land in good condition. But if it is too cloddy or dry, we postpone all applications. There is no use selling a man fertilizer if he won't get maximum results from it."

In addition to fertilizer sales, the company also does a rushing business in the rental and customer application of weed burners. Sacra has from 12 to 15 of these burners all the time ready for use. Farmers may rent them for \$2.50 per day, or the company will do the work and charge in proportion to the time spent. Most farmers rent the tanks and burners, though, and clean their own irrigation ditches.

"The \$2.50 a day brings in some income," said Mr. Williams, "but mostly the profit comes from the sale of the chemicals. This service has also enabled us to sell more fertilizer to these farmers."

Other sales come from the sale

of lawn fertilizer. The company sells only a small amount of insecticides.

"Since the company is primarily a gas company, we decided to concentrate on fertilizer," stated the manager. "By working hard at this, we now are servicing farmers as far as 50 miles down the Pecos River Valley. The weed burners were added at the request of customers who were having trouble keeping weeds and grass out of irrigation ditches."

In summing up the reasons for the firm's success in selling fertilizer, Mr. Williams says service and high grade materials are the two main reasons.

"A dealer must know fertilizer and what it will do," he said. "He must help that farmer make more money. He should also know what he is recommending, how much to apply and how to apply it. A producer can always buy cheaper fertilizer, so if he insists, let him do it. But don't become angry about it. We've lost a lot of them because we didn't cut prices, but almost everyone came back the following year. I believe our service and willingness to go out there in the field and help that farmer makes the difference."

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

Phosphate treated alfalfa plots produced about 1.1 tons more hay per acre than plots that did not receive the treatment in a test demonstration at the Main Station Farm, University of Nevada, Reno, according to William Goodale, superintendent.

Treated acreage produced an average of 7.1 tons per acre as compared to six tons per acre for the untreated. Lahontan alfalfa was used in the Max C. Fleischmann College of Agriculture demonstration on this 19-acre field.

The soil treatment consisted of one application of 186 lb. phosphoric acid per acre. It was applied at the time the alfalfa was seeded.

The soil was a fine sandy loam type with a pH of 9. The average height of the water table was about 3½ to 4 ft. below the surface of the ground. The water table ranged between 4 in. and 6 ft. below the surface at various times throughout the year.

The cost of the treatment was \$13 per acre and produced increased yields valued at \$25 per acre for a profit of \$12 per acre.

The alfalfa was cut four times and received one irrigation between each cutting.

★

"As much as \$135 additional net profit may be realized by the application of 200 lb. of actual potash per acre on potato growing fields in the California San Joaquin Valley." This was a statement made by Dr. Oscar Lorenz, chairman, Vegetable Crops Department, University of California, Riverside, who was speaking at the potash fertility meeting sponsored by the American Potash and Chemical Corp. in cooperation with the American Potash Institute and the University of California at Bakersfield, Cal., recently.

Light sandy soils cropped continuously to potatoes in Kern and Tulare counties generally become low in potash, according to Dr. Lorenz, as shown by an average of eight plots which produced 26 additional sacks of potatoes per acre, over the unfertilized, with the application of 200 lb. of potash.

The calibration of soil tests with plant analysis and visual symptoms for phosphate and potash was reported by Dr. Kent Tyler who is with the University of California at Riverside. "Plant analysis tests for nitrogen may be used effectively as a fertilization guide," he further stated.

Potash deficiencies in cotton were discussed by Forrest Fullmer, agronomist, American Potash Institute. He said that as much as a 200 lb. increase in lint cotton per acre was produced with the sidedress application of 240 lb. of potash on cotton fields low in potash. He presented colored slides showing typical potash deficiency symptoms in cotton, such as leaf bronzing and marginal burn in the top leaves, accompanied by brown dead areas. In the discussion which followed it was shown that this treatment costs about \$15 per acre for potash and produces an additional 200 lb. of lint cotton yielding about \$50 of increased profit per acre.

★

Fertilizer treatments increased the profits from barley by \$15 an acre at the University of Nevada's Main Station Farm at Reno, reports William Goodale, superintendent.

Mr. Goodale and Otto Schulz, ex-

tension agronomist, conducted the demonstrations.

The demonstration compared the yield of fertilized acre plots to similar acre plots receiving no soil treatment on a 20-acre field. The fertilizer application consisted of 60 lb. of nitrogen per acre and 30 lb. of phosphoric acid. The soil treatments cost \$12 per acre.

The treatment increased the barley yield 1,000 lb. per acre. At a market value of \$50 a ton, this represented a gross increase of about \$27 per acre and a net profit increase of about \$15.

The fertilizer was applied with a regular hopper type distributor and was disced into the soil before the barley was seeded. Hilland barley was used in the demonstration.

★

The yield of winter wheat grown on summer fallow went up between 17.8 and 33% as a result of nitrogen fertilization, as compared to wheat grown on non-fertilized summer fallow, in a recent study conducted in northeastern Oregon. The rates of nitrogen used differed from year to year varying from 26 to 48.6 lb. of nitrogen per acre.

These results came out of a study conducted near Pendleton, Ore., during the years 1952 to 1956, according to Charles R. Rohde, University of Nebraska agronomist, reporting on the study.

Mr. Rohde explained that the purpose of the study was to find the effect of nitrogen fertilization on the agronomic characteristics, the yield, and yield components of 11 varieties of winter wheat.

"The varieties differed significantly in all the characters studied and included both hard and soft grain varieties of winter wheat," Mr. Rohde said. "None of the yield components or agronomic characteristics were significantly associated with the grain yield," he added.

Mr. Rohde's report, which was presented at the 1959 annual meeting of the Western Society of Crop Science, was summarized by the National Plant Food Institute.

★

Fertilizer use in California and Arizona would have to be doubled in order to bring about its maximum economic benefit, according to the California Fertilizer Assn. Qualified agricultural authorities say that the average farmer in this area uses only half of the fertilizer which is recommended for best results.

The association pointed out that the nutritional needs of the soils will increase as they are cropped from year to year, unless the deficit is made up through regular application of the proper fertilizers. In countries which have sustained agricultural production for hundreds of years the need for a soil fertility program is recognized. As an example of the different evaluations placed upon the use of fertilizer, the Netherlands uses about 21 times the amount of nitrogen, 20 times the phosphate and 33 times the potash per acre as is used in the U.S.

An outline of the plant food appetites of several crops important to California and Arizona emphasize the importance of maintaining soil ferti-

lity to insure top crop production in future years. The association said sufficient plant nutrients must be present in the soil in an available form, or must be added in the form of fertilizer in order to supply the needs of all growing plants.

Three bales of cotton require 195 lb. of nitrogen, 75 lb. of phosphoric acid and 150 lb. of potash. If any one of these elements is not available at the right time to the growing cotton crop, production will suffer.

Sixteen tons of lettuce must have, in available form, 80 lb. nitrogen, 20 lb. phosphoric acid and 96 lb. of potash. Three hundred and fifty crates of celery require 80 lb. of nitrogen, 60 lb. phosphoric acid and 235 lb. of potash.

Twenty tons of dry onions require 152 lb. of nitrogen, 34 lb. of phosphoric acid and 170 lb. of potash. In order to produce 600 70-lb. boxes of oranges the soil must make available to the trees 90 lb. nitrogen, 30 lb. phosphoric acid and 130 lb. potash.

★

Cattle and sheep prefer to graze on nitrogen fertilized rangelands, according to University of Wyoming agronomists Dr. D. R. Smith and Dr. Robert L. Lang.

"Cattle show a definite preference for forage on nitrogen treated plots," says Dr. Smith. "Field studies in the Big Horn Mountains of Wyoming have indicated that 67 lb. of nitrogen per acre will result in greater forage utilization and production on hilltop ranges." He indicated that the application of nitrogen to the entire acreage of lightly grazed areas was more effective in altering large-scale grazing distribution patterns than treating only strips of the rangeland with fertilizer.

Dr. Lang reports that sheep grazing over an unfenced portion of a test range of native shortgrass at Archer and Gillette, Wyo., in 1958 showed a definite preference for all nitrogen treated plots.

"In this test treatments were 0, 33, and 66 lb. of nitrogen per acre applied in the middle of April, May, and June," Dr. Lang said. "Effects were measured in terms of yield, crude protein content and palatability to sheep."

Production of blue grama shortgrass, measured in September of 1958,

was increased significantly from nitrogen applications, and the percentage crude protein measured in July was significantly raised by nitrogen applications, Dr. Lang reported.

★

Fertilizer can materially increase net income from pasture and range land, said the California Fertilizer Assn. It said that the average livestock producer and the average dairyman use this vital crop production tool in inadequate amounts.

The U.S. Department of Agriculture recently said that farmers, caught in the cost-price squeeze, must obtain the best economic use of all their tools of production, and that they will doubtlessly weigh more carefully now than ever before their needs for chemical crop production aids.

The farm agency said, "The trend toward a more efficient, balanced agriculture is resulting in wider use of plant foods. Studies by USDA show that farmers in general seem willing to spend money and time to fertilize such crops as corn, cotton, vegetables and many others while they virtually neglect hay, pasture and cover crops. The averages show, for example, that potatoes get 83 lb. per acre of nitrogen, and green and yellow vegetables 68 lb., while hay crops receive only 1 lb. of nitrogen per acre, and pasture or cover crops less than a ½ lb. per acre. A similar situation exists with phosphate and potash. The increasing emphasis on grassland agriculture will, however, necessitate increased use of fertilizer on pasture crops, in many cases along with irrigation. Research is showing farmers how to make these practices pay."

The statement concluded, "Today, more than ever before, farmers need to use combinations of crops and fertilizers that can reduce cost of production and increase returns."

"The USDA finds that failures to obtain stands in seeding pasture and hay crop cost farmers \$50 million a year in wasted seed alone. Recent studies show that complete fertilizers, high in phosphate and properly placed in relation to forage crop seeds at the time of seeding, not only boost yields, but also help to keep down weeds."

Accurate Lime and Fertilizer Spreads From 100 lbs. Per Acre and Up!

NEW LEADER L-32S SPREADER

- 12.5 H.P. Engine drives Twin Spinners for even spreads!
- 24" Conveyor driven by PTO or drive shaft drive for precise per-acre requirements!
- Available with full line of optional attachments!



DEMAND FOR CUSTOM SPREADING IS GROWING

More and more farmers want the convenience of a bulk spreading service. It saves them time, equipment and maintenance expense plus, up to \$4-\$8 per acre over bagged goods. Let us help you get started in business with "New Leader".

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HIGHWAY EQUIPMENT COMPANY

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ADDRESS.....

TOWN.....STATE.....

☐ Farmer ☐ Operator ☐ Student

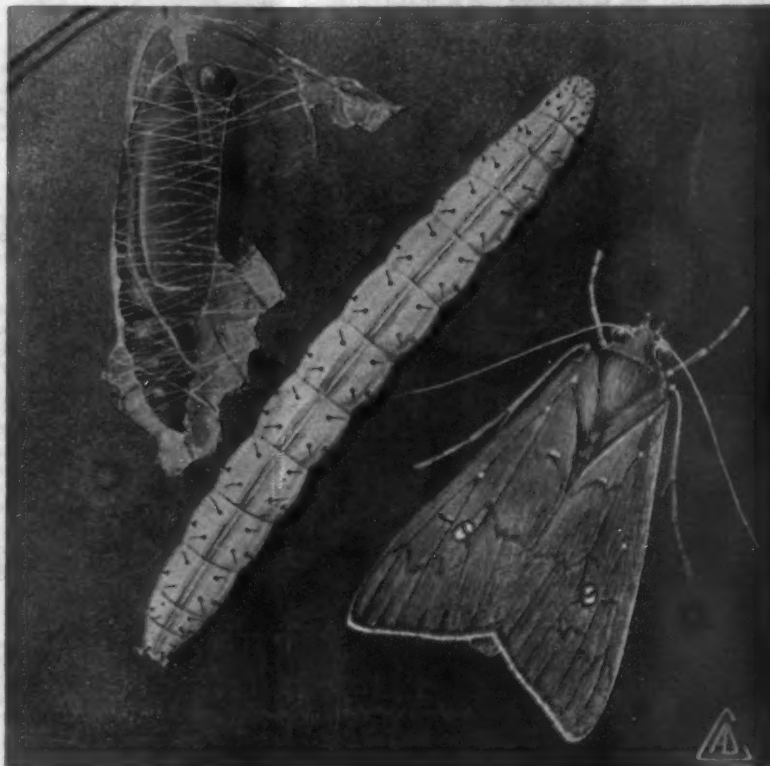
Mail coupon for L-32S literature and a copy of "Your Land Is Different" a booklet designed to help you sell more bulk fertilizer.



BUG OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board

Cotton Leafworm



How to Identify

The cotton leafworm is a tropical pest. Although it cannot survive winter months in the U.S., new infestations are started each spring by moths that fly in from the south and lay their eggs on cotton. The full-grown worm is about 1½ inches long, greenish, with white and black stripes and with black spots over its body. Its half-looping crawl is characteristic.

Habits of Cotton Leafworm

The first leafworms usually appear in April, May or June, usually in southern Texas, but sometimes in Florida. As the leafworms increase in numbers, the moths fly to other areas and in some years invade all the cotton states except California. It is the larvae, or "worms," that feed on cotton. The small leafworms feed on the underside of the leaves and do not cut through the upper surface. Eggs are laid on the underside of the leaves. Worms hatching from these eggs become full grown in 2 or 3 weeks. The worms change into brown pupae in folds of the leaves. In

about a week, the moths emerge and a new life cycle begins. The insect has 3 to 6 generations in one season. Wet weather is favorable to leafworm outbreaks.

Damage Done by Leafworms

Although smaller worms feed on the underside of the leaves and do not cut through the upper surface, larger worms eat the entire leaves. When abundant, they completely strip, or "rag" the leaves and then gnaw on the squares, bolls and bark until the field looks as if it had been burned off. Early ragging of plants prevents the bolls from maturing and reduces the yield and quality of the cotton.

Control of the Leafworm

A number of materials and combinations of pesticides have been found effective in control of the leafworm. State recommendations should be followed closely in attempting to control this pest. Large worms are more difficult to kill than are the smaller ones and may cause considerable amounts of stripping before they die.

Drawing of cotton leafworm furnished Croplife through courtesy of Hercules Powder Co., Wilmington, Del.

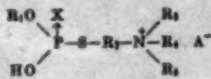
PATENTS and TRADEMARKS

2,922,738

Fungicidal Compositions. Patent issued Jan. 26, 1960, to John P. McDermott, Springfield, N.J., and Rex D. Closson, Northville, Mich., assignors to Esso Research and Engineering Co., New York, and to Ethyl Corp., New York. Method of combating fungi comprising treating the locus of the fungi with a material selected from the class consisting of diorganotin enolates, triorganotin enolates, diorganotin esters of phosphorus acids, triorganotin esters of phosphorus acids, diorganotin xanthates, and triorganotin xanthates wherein said organo group is selected from the group consisting of alkyl groups having one to six carbon atoms and aryl groups having six to 10 carbon atoms and wherein said phosphorus acid is selected from the group consisting of phosphoric acid, phosphorus acid, pyrophosphoric acid, hypophosphoric acid, phosphonic acid, phosphonic acid, and metaphosphoric acid and wherein said enolate is selected from the group consisting of mono-ketones, α -diketones, β -diketones, keto esters and active methylene compounds wherein a methylene radical is between two carboxylic groups, and wherein said xanthate is selected from the group consisting of alkyl xanthates and aryl xanthates.

2,922,750

O-Hydrocarbon, S-(Quaternary Ammonium-Substituted Alkyl) Esters of Phosphorothioic Acids and Insecticidal Compositions Thereof. Patent issued Jan. 26, 1960, to Jack A. Snyder, Claymont, Del., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Di-O-S-hydrocarbon esters of phosphorothioic acid represented by the formula



where:

X is selected from the group consisting of oxygen and sulfur.

R₁ is selected from the group consisting of alkyl radicals of from 1 to 4 carbon atoms, inclusive, alkenyl of 2 to 4 carbon atoms, benzyl, phenyl, halophenyl, nitrophenyl, and tolyl radicals.

R₂ is an alkylene radical of 2 to 4 carbon atoms.

R₃ is selected from the group consisting of alkyl radicals of 1 to 4 carbon atoms, inclusive, and alkenyl radicals of 2 to 4 carbon atoms.

R₄ and R₅ are the same and are selected from the group consisting of alkyl radicals of 1 to 4 carbon atoms, inclusive, and alkenyl radicals of 2 to 4 carbon atoms, with the proviso that R₄ and R₅ can be taken together to form, with the included nitrogen, a ring selected from the group consisting of pyrrolidine, piperidine, piperazine, and morpholine.

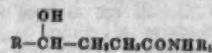
A is selected from the group consisting of halogen, alkyl sulfate of from 1 to 4 carbon atoms, inclusive, benzene-sulfonate, and toluenesulfonate.

An insecticidal composition comprising, in an insecticidally effective amount, at least one compound described in claim 1, and an inert carrier.

2,922,740

Nematode Control. Patent issued Jan. 26, 1960, to Earl P. Williams, Pen Argyl, Pa., and Raymond L. Mayhew, Phillipsburg, N.J., assignors to General Aniline & Film Corp., New York. The process of eradicating and controlling soil nematodes which comprises introducing into the nema-

tode infested soil a nematocidal amount of at least one N-alkyl- γ -hydroxycarboxylic acid amide having the following general formula:



wherein R represents a member selected from the class consisting of hydrogen and methyl groups, and R₁ represents at least one aliphatic hydrocarbon radical of the alkyl and alkylene series containing from three to 18 carbon atoms.

2,922,741

Compositions for Combating Nematodes. Patent issued Jan. 26, 1960, to Ewald Urbach, Kohn-Mulheim, and Bernhard Homeyer, Kohn-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany. A method of combating nematodes which comprises applying to soil infected with nematodes an effective amount of a compound of the following formula



in which R stands for an aminogroup, X stands for a member selected from the group consisting of oxygen, sulfur and an iminogroup, R₁ stands for a member selected from the group consisting of azo and hydrazo radicals, R₂ stands for a member selected from the group consisting of hydrogen, lower alkyl, chloro, bromo and nitrogroups and R₃R₄ stands for a member selected from the group consisting of two hydrogen atoms and one oxygen atom.

2,922,742

Method and Composition for the Control of Fungus Organisms. Patent issued Jan. 26, 1960, to Richard H. Gruenhagen, Midland, Mich., assignor to the Dow Chemical Co., Midland, Mich. A method which comprises applying to fungal organisms and their horticultural habitats a fungicidal amount of amine compound selected from the group consisting of bicyclohexyl-4-amine and its inorganic acid salts.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$35 must accompany each notice of opposition.

Harvest Supreme, in capital letters, for insecticides, herbicides, fungicides and weed killers. Filed May 13, 1958, by Thompson Distributing Co., Algona, Iowa. First use April 1, 1958.

Pratts, in capital letters, for insecticides and other products. Filed Oct. 13, 1958, by Pratt Laboratories, Inc., Junction City, Ky.

Aero, in capital letters, for ammonium sulfate and cyanamide. Filed May 27, 1959, by American Cyanamid Co., New York. First use July 5, 1958.

EB-30, in capital letters, for grain fumigant. Filed March 13, 1959, by the Dow Chemical Co., Midland, Mich. First use Aug. 26, 1958.

Design, drawing of flower and elaborate leaf over rectangle containing word Flor-N-Lef, for fertilizer. Filed June 29, 1959, by Activator, Inc., St. Louis, Mo. First use May 6, 1959.

Pittsburgh B-623, in capital letters,

for fungicides. Filed Jan. 16, 1959, by Pittsburgh Coke & Chemical Corp., Pittsburgh. First use Oct. 25, 1955.

Agrotol, in capital letters, for insecticides. Filed May 12, 1959, by Merck & Co., Inc., Rahway, N.J. First use April 27, 1959.

Design, drawing of black flag with words Black Flag inscribed, for insecticides, miticides, fungicides and other products. Filed June 26, 1959, by American Home Products Corp., d.b.a. Boyle-Midway, New York. First use Jan. 2, 1955.

Design, drawing of undraped male holding sign with words Green Giant Plant Fertilizer, for plant fertilizer. Filed June 26, 1959, by Daniel N. Pompilio, d.b.a. Green Giant Plant Products, Mount Vernon, N.Y. First use April 12, 1957.

Rav-On, in hand drawn capital letters, for fertilizer. Filed Sept. 3, 1959, by Phil Raven & Sons, d.b.a. Rav-On, Selma, Cal. First use June 15, 1959.

Fert-O-Lite, in hand drawn script, for fertilizers and soil conditioners. Filed Sept. 8, 1959, by South Western Chemical Co., Cucamonga, Cal. First use August, 1958.

FOREST LOSSES SEEN

SACRAMENTO—Catastrophic losses from insects appear to be in store for California forests, according to Dr. Keith Arnold, director of the federal Pacific Southwest Forest and Range Experiment Station.

Dr. Arnold told the California State Board of Forestry that timber losses may reach two billion board feet and that insect conditions of epidemic proportions exist in 10% of the state's commercial forests. He stated that the estimated loss will be more than one third of the annual timber harvest.

Knox Marshall, chairman of the California Forest Pest Action Control Council, supported Dr. Arnold's warning. He said he plans to ask the state forestry board next month to approve zones of infestation so that state and federal pest control funds may be spent to fight the problem.

BUYS AIRPLANE

NIAGARA FALLS, N.Y.—A 1960 model Beechcraft Super G 18S, has been purchased by Hooker Chemical Corp. at Niagara Falls.



ED WILLIAMSON (top photo), extension soils specialist, points out a feature of the South Dakota State College general crop guide which was unveiled at the 10th annual Fertilizer and Soil Management Short Course held in Brookings. Looking on (at left) are George Blake and William Martin, University of Minnesota soils experts, and Moe Williams (right), chief agricultural economist with the National Plant Food Institute, Washington, D.C. The crop guide will soon be on display in government offices and business places throughout South Dakota. Pictured in the lower photo are officers and directors of the South Dakota Fertilizer Assn. which held its first annual meeting in conjunction with the short course. Left to right, they are Andy Anderson, Dakota Fertilizer Co., Canton; Steve Jones, Brookings, Land O'Lakes Creameries, recording secretary; Ole Palmquist, Milbank, Green-Gro Fertilizer Co.; C. W. Schladoweller, Madison, Schladoweller Farm Service, president; Boyd Meyer, Alexandria, Farmers Union Central Exchange, and Mervin Nelson, Howard, Farmers Union Oil Co. Directors not shown include Al Klavervkamp, Sioux Falls, Summers Fertilizer Co., treasurer and executive secretary; Lester Hansen, Kranzburg, Lester Hansen Elevator Co., and Leo Fuhr, Brookings, professor of agronomy, South Dakota State College, ex-officio member.

Research Makes the Difference . . .

Regional Competition Grows As Agricultural Changes Continue

By Dr. Harvey J. Stangel*

Nitrogen Division
Allied Chemical Corp.
New York

AFTER LOOKING at American agriculture from many points of view, it is difficult for one to come up with anything but a feeling of self satisfaction, not for himself but because of the truly remarkable accomplishments of the people who have preceded him. We are one of the few countries in the world which has succeeded in producing enough food for everyone!

For this achievement everyone concerned, the university research and extension groups, industry and the farmer all deserve a pat on the back. This tremendous team is moving toward closer cooperation, and even more impressive, accomplishments in the future.

Increasingly rapid changes and progress have become the rule. With some of these changes we are already acquainted. Many in the trade have personal acquaintance with some of these changes. For example, the increase in the size of the farms. I grew up on a farm in Wisconsin and return to the area infrequently enough so that any changes tend to be more apparent than they might be to the local residents. About 20-25% of the people I knew are gone and in almost all of the cases the farms sold were added on to one of the neighbors'. Larger and more profitable units are being put together.

And as I look at the picture again it suddenly becomes apparent that it is the successful farmer, the man who likes to farm, and I believe the more able farmer, who is remaining. It appears that the farmer who remains, and this is by choice, is a new type. If you think back over years I believe you will find similar changes in your communities, and I believe you will agree you have a more discriminating customer.

The changes in technology have ushered in another phase of a factor which has been with us a long time. Competition is basic to our way of life. It is a fact of economic life both on an individual and a regional scale. Now even though the farmer in the area may successfully compete with his immediate neighbors, he must also compete with the rest of the farmers in the nation.

Competition between regions of this country is becoming more intense. Within the last 10-15 years we have seen the Southeast lose much of its cotton to the Southwest. Last year, 9 out of 10 of the top cotton producing counties in the United States were west of the Mississippi. We have also seen how farmers in Florida and California have taken the large metropolitan vegetable and fruit markets from farmers in the immediate vicinity of these areas.

Even the potato market is dominated by farmers who are far removed from the area of consumption. And yet, many of these commodities can be produced just as profitably and of as good quality by farmers within 50 to 100 miles of the cities. I have been somewhat curious why some of these changes took place. Not all of them can be explained by climate or soil.

*From paper presented before University of Minnesota Fertilizer Conference Dec. 8, 1959.

TABLE 1. Yield and Use of Plant Food on Cotton in Selected States in 1954

State	Yield	N	P	K
California	806	81	16	1
Arizona	1,037	87	25	0
Georgia	286	40	45	48
Alabama	298	37	48	31

You will note from Table 1 that the South uses less than 1/4 the rate of nitrogen per acre on cotton than the Southwest does and has about 1/4 the yield. Now you may say the climate or irrigation made the difference. I wonder! Last year in Alabama the experiment station pro-

duced almost 4 bales of cotton per acre under irrigation and they used several times the amount of plant food now recommended on cotton in that state! The shift in cotton acreage took place under supported prices which insured profitable cotton for even the marginal grower.

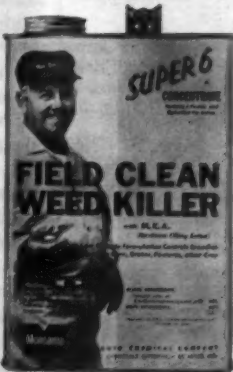
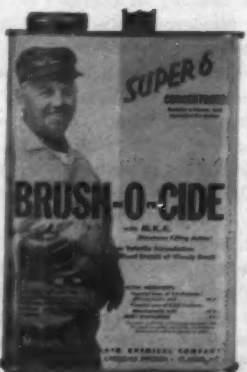
The shift took place for economic reasons but it was not forced. This means that average production practices were profitable. There was little incentive for anyone, whether we consider the farmer, industry or the research and extension service, to change. They thought the "status quo" was protected and woke up to find someone else was producing higher yields of cotton more economically.

TABLE 2. Yield and Use of Plant Food on Corn in Selected States in 1954

State	Yield	N	P	K
Iowa	55	25	24	16
Minnesota	51	15	24	28
Mississippi	17	45	28	17
Colorado	55	64	7	0

"Red" Emm shows you...

**HOW MONSANTO
WEED KILLERS
BUILD STORE TRAFFIC
...HELP YOU SELL!**



New "Red" Emm SUPER-6 CONCENTRATES! Brush Blitz, Crop-Guard Weed Killer, Brush-O-Cide, and Field Clean Weed Killer... a new line of 6-lb. formulations that give your customers more "kill" at a lower cost...two cans do the work of three! These SUPER-6's spray 50% more acreage than ordinary 4-lb. formulations.

TABLE 3. Yield and Use of Plant Food on Potatoes in Selected States in 1954

State	Yield	N	P	K
Maine	342	140	225	261
California	408	125	41	13
New York	330	71	142	146
Michigan	295	59	112	138

The relationship between yield and plant food use is not as pronounced in corn and potatoes as was shown in cotton. Yet I believe we will find that such a relationship will develop if average yields between states are widely different. Improved varieties are available. Yet the grower is not taking full advantage of the possible potential. One of the big reasons is the use of less than optimum amounts of plant food.

As always happens, new methods and new crops come into an area to replace those lost. The Southeast now has underway an intensive campaign to produce the corn they need for broiler production and that

which they will need for beef production. They are not just trying to produce corn but to produce corn cheaper than it can be shipped into the area from the Midwest!

The Southeastern farmers can produce from 10-12 tons of hay per acre from Coastal Bermuda grass. But did you know that by taking this hay and pelleting it they have produced experimentally 2,500 pounds of beef per acre? To do this takes a lot of fertilizer, in terms of nutrients 400-100-200. If the Bermuda grass is to be pastured the amount of plant food is cut in half simply because so much is produced the cattle cannot utilize it efficiently.

If instead, 600 lbs. of nitrogen per acre is applied this same Bermuda grass can be dehydrated and used to replace alfalfa meal in animal rations. I have also talked to dairy farmers who claim to be able to carry 7 to 9 cattle per acre on Coastal Bermuda grass during the growing season.

I mentioned some of these things to a dairy farmer friend of mine in Wisconsin and his first reaction was "Where would you suggest I buy a farm down there?" The Midwest is going to have some real competition from other sections of the United States in the near future. Farmers in other parts of the United States are learning to produce corn, hay, beef and milk cheaper than it is now being produced. It is going to take some real team work by industry, the college and the farmer to remain competitive with the rest of the United States.

I don't mean to imply that all of these changes are due to fertility. Other factors are equally important. Management or the ability to put knowledge to work as an economic package is probably most important now. On a long term basis probably the key to most of these changes is the plant breeder and his ability to

breed and select new strains capable of producing at higher levels and able to efficiently utilize fertilizer.

Now, with these types of changes taking place (in most cases in less than one generation) our most pressing problem is that of communication. How do we get information into the hands of the farmers who need it? How do we convince them they should use it? I mean the farmers who don't come to meetings and who don't read the articles as well. The next time you go to a meeting count the number of people there for whom the meeting is intended. Many times we can be accused of talking to ourselves. At future meetings such as this I would like to see speakers devote some time to the following subjects:

1. How to hold meetings.
2. How to conduct demonstrations.
3. Effective advertising.
4. Using agronomy in effective advertising.

Undoubtedly, all of you have better ideas as to what you would like to hear. But to be effective you must let people know your wants.

We need research in methods of communication, in methods of changing practices in a much shorter period of time. We can no longer depend upon changing practices by educating the younger generation. Agriculture is changing much too fast for that. It is not fair to the younger generation to place the burden of long overdue improvements on their shoulders. The capital requirements necessary are already proving to be too great for most of them to assume.

I hear a lot about profits, economics and the ability to provide and enjoy the finer things in life as the great motivator for the farmer. This is open to some question. I think some other factor may be the key one. Recently I had the opportunity to observe a vegetable auction block. It became apparent after watching this operation for a few minutes that the buyers didn't take time to inspect the load adequately, in fact, they couldn't because the crop was crated up, yet the price of cauliflower varied from \$1.60 per crate to a high of \$2.40 on the same day. I was told that the buyers bought mainly on the reputation of the grower.

Here is about as great an economic incentive as I have ever seen in agriculture—the opportunity to increase gross income by 50% and profit by perhaps 100% yet it was not done. At first, I thought this might be because the farmer didn't care, yet I know from experience that these farmers do care.

I can only conclude now that these farmers did not know how to get that premium price!!! Further, that they did not know how to ask the proper questions and further still, that they weren't relating the key practices to economic return. This is a serious indictment of the efforts of all who are attempting to communicate with the farmer.

Another case, was that of the farmer who buys nitrate of soda. It seems in this case a fertilizer salesman was taking a dealer to task for not pushing ammonium nitrate in preference to sodium nitrate. His sales talk was to the point and convincing but the dealer said he was not getting anywhere with the farmer. Finally the dealer pointed out the window and said to the salesman, "Here comes John Jones to buy some soda. You tell him what you've told me and see if you can convince him!"

The salesman did just that, he presented his story, and the farmer allowed as how ammonium nitrate would probably be better than soda, but that he would like to have a few days to think it over. When the farmer left, the dealer turned to the salesman and told the salesman that he had just lost a sale. The farmer had come in intending to buy soda but now he would go to his competitor down the road and buy soda

Here's a free double-barreled direct mail program that really brings the customers in...a tried and proven traffic builder...just stock 100 gallons of any combination of Monsanto weed and brush killers. Monsanto will send out two mailings to 100 of your top customers. The first mailing invites them to come into your store... the second mailing offers them a \$1.00 pack of farm utility needles absolutely free! You get 200 mailings and 100 of these useful needle packs at no charge.



Grassy-Weed Killers! Randox® and Vegadex®—new spray-as-you-plant weed killers—knock out grassy weeds in corn, soybeans, and vegetables. Exclusive products for higher dealer profits.

Easy-to-use containers that "tell" and "sell"! These new 5-gallon spout-top cans almost sell themselves. Each can tagged with complete "how-to-spray" instructions written in plain language.

Monsanto advertising sells and re-sells your customers! Your customers will see "Red" Emm products advertised in Farm Journal, Progressive Farmer, Farm Quarterly and many state farm papers.

Lifelike display of "Red" Emm solves weed problems! Giant display with the "dial-the-crop" selector answers customers' questions for you—tells just what weed killer to use.

Monsanto

Learn how Monsanto can help you sell more in 1960. Mail this coupon right now (while you are thinking about it) and get all the money-making facts.

Monsanto Chemical Company, Organic Chemicals Division
Agricultural Chemicals Department, St. Louis 66, Missouri

Sounds good! Please send me more information regarding the new Monsanto Weed and Brush Killer line.

NAME.....

FIRM.....

ADDRESS.....

CITY or COUNTY.....STATE.....

there. They checked and that was exactly what had happened!

It would be very interesting to know what things influenced this farmer. He had had the economics and the agronomic advantages explained to him. This was not the first time that he had received this information. One member of the group which evaluated this contact reached the conclusion that the farmer was placed in a position where he would have lost face had he changed fertilizers. We have the difficult task of introducing ideas and products, yet the things we consider to be obvious may not be the key factor to those whom we are working with.

According to some surveys, farmer meetings are no longer the most effective media to use in reaching farmers to spread new ideas. Many of us haven't changed with the times. We have promoted slightly new ideas in the same old way not realizing that our audience has been gradually slipping away. Even magazines and radio are not as effective as they once were. People, according to one survey, are spending an average of 3 to 4 hours a day watching television. How much time do you think this gives them to read or listen to the radio or come to your meetings?

We need to know what media the farmer spends most of his time with, not just newspapers versus something else, but what type of newspaper. He may take two newspapers, yet get most of his farm information from one of them. We need to know what methods are reaching the farmer most effectively. And please don't confuse the most effective method of reaching yourself with that of reaching your customer.

I would like to leave one last thought with you. Several studies have shown the fertilizer dealer and the salesman to be a poor source of information to the farmer. I don't believe this is the case. The man to whom the farmer comes to make a purchase is in one of the best positions to influence a decision. This position of influence is strengthened by good service. By service I mean how to use fertilizer, knowledge of different forms, how it should be placed, varieties to use, insecticides and weed killers to use, amount of fertilizer to use, etc. Service has been shown to be more important than price or brand name.

A study made by the University of California on the effect of the fertilizer dealer in fertilizer use, concludes that "fertilizer companies should reappraise the service program they provide their customers. It appears this factor is critical in the farmer's decision of which concern he will patronize."

California Chemical Employment Rises

SAN FRANCISCO—Employment in chemical manufacturing and producing industries in California climbed to a new high in November, and rose to a level about 3% above that of the previous November.

The number of wage and salary workers in chemicals and allied products was estimated at 38,900 by the division of labor statistics and research of the California State Department of Industrial Relations. The figure compares with 37,600 during the previous November, and a climb from 38,700 during October of the year just ended.

Production workers in the agricultural chemical division increased their average weekly earnings during November to \$99.77 from the average of \$98.95 in October, and \$93.67 12 months before. The hourly earnings for the three months in order averaged \$2.41, \$2.39, and \$2.33.

The number of hours worked averaged 41.4 in both November and October, and 40.2 in November of 1958.

Weeds Rob Crops of Moisture, Nutrients, Cut Yields Greatly, Illinois Group Told

URBANA, ILL.—Weeds left growing in corn and soybean rows can rob a farmer of one fourth of his entire crop, attendants were told at the Jan. 28 Illinois Custom Spray Operators' School.

In three years of research completed by E. L. Knake at the University of Illinois, giant foxtail left undisturbed in corn rows cut yields by almost 23 bu. an acre. Clean plots with no weeds produced 93.5 bu. an acre. Plots where weeds were left growing in the row yielded only 70.6 bu.

Clean soybean plots produced 38.5 bu. The most heavily weeded plots made only 27.6 bu.—a drop of almost 11 bu.

A poor cultivation job that leaves part of the weeds in the row also causes serious yield losses, the speaker said. When only one giant foxtail per foot of row remained, corn yields dropped 7 bu. an acre; soybeans dropped 1.7 bu. Three weeds per foot reduced corn yields 8.5 bu. an acre and soybeans 2.3 bu.

In these studies, cultural practices were similar to those used by farmers except that only the area between the rows was cultivated. The weeds were left growing in the rows and thinned to various stands.

In 1959, a study of yield losses from pigweed was started. The first year's results showed that just one weed every inch in the row would

cut corn yields by 26 bu. and soybean yields by 17 bu. Further tests are being planned with broadleaf weeds.

Giant foxtail has become a more noticeable pest in Illinois corn fields in recent years, Mr. Knake reports. The effective use of 2,4-D to kill broadleaf weeds may have given giant foxtail, a grass weed, more favorable growing conditions.

New pre-emergence herbicides, though more costly, will control giant foxtail. The Illinois research shows, however, that a farmer can afford to spend \$5 to \$10 or more an acre for pre-emergence herbicides to get rid of giant foxtail.

The research also shows that adding fertilizer and letting the weeds grow is not the answer. Adding 240 lb. nitrogen an acre on plots with both corn and weeds did step up yields from 80 to 100 bu. in 1958. But the nitrogen plots with no weeds produced 115 to 120 bu. In 1958 rain was plentiful. In 1959, when it was dry, no corn yield increase with nitrogen was obtained as long as weeds were present.

Three years' test with weeds led the Illinois agronomists to conclude that the only good weeds are dead ones. Even when the number of weeds seem small, a farmer can invest quite a little time in cultivating and in weed control chemicals and get a good return on his investment, the school was told.

Howard J. Grady Elected President of Calspray

RICHMOND, CAL.—Howard J. Grady has been named president and director of California Spray-Chemical Corp. to succeed Arthur W. Mohr whose retirement became effective Feb. 1, 1960. Mr. Grady was formerly executive vice president of Calspray. His new position also carries the title of president of Ortho Agricultural Chemicals Ltd., of Canada.

Mr. Grady is a native of Pennsylvania and a graduate of the University of Kansas. He joined Calspray in 1926 as a research entomologist and served as the company's European representative from 1931 to 1939. During World War II he served as branch manager in Portland, Ore., and later as manager of the Pacific Northwest sales district.

In 1948 he went to Washington, D.C., as regional manager of marketing on the East Coast and ten years later was named executive vice president at Calspray headquarters in Richmond. During the Korean War, Mr. Grady served the Office of Price Stabilization as manager of the agricultural chemicals branch.

Mr. Mohr joined Standard Oil Co., parent organization to Calspray, in 1922, was associated with American Bitumuls Co. from 1930-1946, at which time he rejoined Calspray. He is a prominent figure in the National Agricultural Chemicals Assn., having served as president from 1951-53 and has served on the NAC board of directors. He is a graduate of the University of California.

California Spray-Chemical Corp. is a subsidiary of Standard Oil Company of California and manufactures a complete line of pesticides marketed under the "Ortho" label throughout the world.

Cominco Products Holds Dealers' Meeting

SPOKANE, WASH.—More than 80 persons attended the two-day 3rd annual Elephant Brand Liquid Fertilizer dealer meeting held here Jan. 27-28 with G. R. Inkpen, Cominco Products, Inc., assistant manager, acting as chairman.

Objective of the conference was to assist dealers with problems in the operation of business and sales in the field, said K. T. Seaborne, Cominco manager.

A featured speaker on the program was A. R. Quine of the Executive Management Institute of Spokane, who discussed management and supervision, predictable profits, and salesmanship.

Also discussed were "Credit, Friend or Foe," by Richard Kube, Spokane manager for Balfour, Guthrie and Co., Ltd.; "Advertising" by H. W. Bayley, advertising supervisor for Cominco Products, Inc., British Columbia; "Dealer Insurance," by Bing Farmin, Farmin Rothrock & Parrott, Inc., and "Compensation and Safety" by Walt Gurnea and Don Littlemore of the Washington State Department of Labor and Industry.

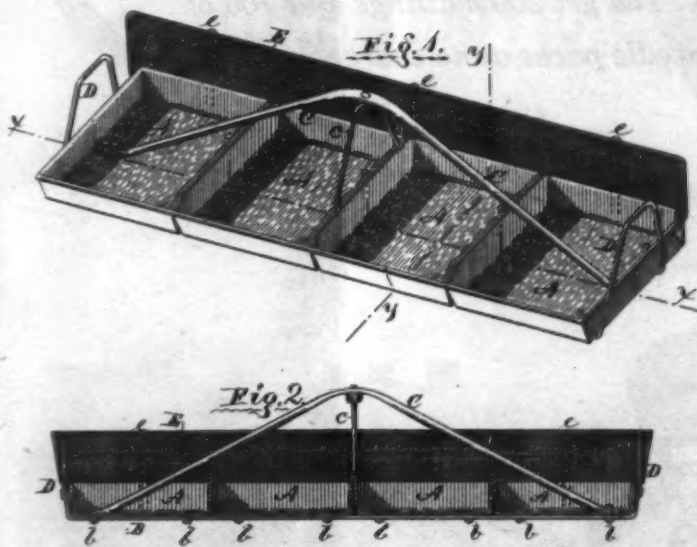
F. J. L. Miller of the research department of Cominco reported on the firm's research program, and D. A. Jamison, Cominco agronomist, told of test plot demonstration work and fertility promotion.

Lyle Hinkins, field equipment supervisor for Cominco, headed a panel discussion on equipment developments.

Monthly Lime Report

WASHINGTON—Domestic sales of open-market lime in November, 1959, was 824,579 short tons and was higher than the previous month's output, reported the Bureau of Mines, U.S. Department of the Interior. Refractory and chemical lime increased whereas a decrease was noted in agricultural and construction lime.

Saga of Insect Control



JUST LET THE GRASSHOPPERS COME, may have been the feeling of Lorenzo B. Canfield, Syracuse, Neb., after patenting his "Improved Grasshopper Catcher" in 1877. The device, to be carried by two men, or otherwise propelled over an infested field, was calculated to destroy the hopping pests by causing them to jump into containers of oil which would kill on contact.

"The invention consists in the use of one or more pans . . . adapted to contain petroleum, so that as the pans are passed along over the land, the rising grasshoppers will fall or alight within them (the pans) and be destroyed therein or, hopping out, die on the ground from the effects of the contact with the oil," the inventor explained in the language of the patent.

Figure 1 above is a perspective view of the machine and figure 2 a longitudinal sectional view. The pans shown are about two to three ft. long and three to four inches deep. The front side of the pans are a little inclined "to facilitate passing over grass, oats, wheat, and vegetation similar in size."

This device was patent No. 187,509, dated Feb. 20, 1877.

Forest Insect Control Breakthroughs Noted at Entomological Branch Meeting

SAVANNAH, GA.—“Scientific breakthroughs have been achieved in the control of forest insects,” according to Dr. C. O. Eddy, a past chairman of the Southeastern Branch of the Entomological Society, meeting in Savannah at the Hotel DeSoto recently.

“Cottonwood pulp plantations can now be made to grow fast, straight and tall by using systemic insecticides,” says Dr. Eddy referring to recent tests in Mississippi.

Robert Morris of the U.S. Department of Agriculture at Stoneville, Miss., is studying the systemic chemicals on cottonwood. His effort is directed toward preventing stunting that results from attack of young cottonwood trees by twig boring insects. Mr. Morris found that by dipping cottonwood cuttings in a chemical known as thimet at planting time he could prevent attack of various species of insects and obtain up to 3 or 4 ft. additional growth per year as compared to untreated cuttings.

“Forest insects are big business,” Richard R. Mason, forest entomologist of Boawater Southern Paper Corp., stated in his address before the society.

Mr. Mason said that insects present an important stumbling block in growing timber and pulpwood. Millions of acres of pine are subject to insect damage. Also, after trees are cut and stored as pulpwood they are subject to insect attack. This attack damages the wood, causes decay, and loss of quality. The pulp and paper industry is conducting research to meet the problem.

In commenting on the speeches about forests and their protection from insects, R. J. Kowal, chief of forest insect research of the Southeastern Forest Experiment Station, stated that forestry is important to the South, and particularly to Georgia.

“Keeping the house fly under control requires constant research and education of our public,” commented Carl Nettles, leader in extension entomology at Clemson College, S.C.

“Preliminary studies were conducted at Clemson College, S.C. to determine the effectiveness of various insecticides as residual sprays for the control of house flies,” reported T. R. Atkins, Jr., entomologist. “Of the toxicants tested, Dimethoate applied as a 1.0 percent spray gave good control for 10 weeks.”

Tests using insecticide-treated cords were reported by Dr. E. C. Burns, Louisiana State University, to determine their effectiveness for the control of house flies infesting pig parlors in the Baton Rouge area. Cords treated with 12% Korlan, 25% Diazinon, or Bayer 29493 (Baytex) produced effective fly control for more than 10 weeks, according to Dr. Burns.

“The imported fire ant likes peanut butter,” reported Sidney B. Hays of the Department of Entomology, Auburn University. Acting upon this lead, Mr. Hays added an insecticide to peanut butter, filled soda straws with the bait and scattered them over infested areas. Mr. Hays observed the results over a period of time and found that the poison bait completely eliminated the ants.

At the society's business session, Irwin J. Becnel of New Orleans became the new chairman of the Southeastern Branch, succeeding Prof. F. E. Guyton of Auburn, Ala.

Other newly elected officers of the branch are Dr. Carroll N. Smith, Orlando, who was named chairman-elect, to succeed Mr. Becnel as chairman one year from now.

Dr. John S. Roussel, professor of research entomology, Louisiana Agricultural Experiment Station, Baton

Rouge, La., was elected to serve as secretary-treasurer.

New members of the executive committee are Dr. R. J. Kowal, North Carolina and Gordon Barnes, Arkansas.

Mr. Becnel, a leader in insect activities in the south for many years, and a native of Louisiana, is director of agricultural research for the Freeport Sulfur Co., New Orleans. He is a graduate from Louisiana State University with bachelor and master of science degrees. He has done additional graduate work in the field of entomology at Ohio State University.

Dr. Carroll N. Smith, the new chairman-elect, is entomologist in charge, Entomology Research Division, USDA, Orlando, Fla. Dr. Smith has been associated with the Orlando laboratory for 13 years. He has served 29 years with the U.S. Department of Agriculture.

Vulcan Steel Container Names Representative

BIRMINGHAM, ALA.—Gordon D. Zuck, president of Vulcan Steel Container Co., has announced the appointment of Gerry E. Cook as sales-service representative for the state of Tennessee.



Gerry E. Cook

A native of Tennessee, Mr. Cook received his education in the Memphis schools. For the past 15 years he has been active in the paint and chemical fields, having served as manager of sales of raw materials and supplies.

Mr. Cook has been honored in the Memphis area as past president of the Memphis Paint, Varnish and Lacquer Assn. and as general chairman of the 1956 “Memphis City Beautiful Commission.”

OKLAHOMA SALES

STILLWATER, OKLA.—Sales of fertilizer in Oklahoma during December, 1959, amounted to 1,724 tons.



LOOKING FOR RESIDUES—A fast, simple method of detecting insecticide residues on food is the goal of a Washington State University research project which recently received a grant of \$25,000 from the U.S. Public Health Service. Above is Dr. Robert F. Harwood, WSU research entomologist, who will use the grant to perfect an insecticide-detection test he developed over the last three years with the assistance of Sutharn Arekul of Thailand, a graduate student.

The test pinpoints the kind and amount of insecticide on fresh fruit and vegetables by its effects on insects. Dr. Harwood uses a solvent to extract the chemical from the food, then evaporates the solvent. Reaction of different insects exposed to the chemical residue provides the key to the type and concentration of insecticide involved. The test is said to be performed in a relatively short time and with simple equipment. (WSU photo.)

Niagara Reports On New Herbicide

BILOXI, MISS.—Dicryl, a newly developed herbicide designed to chemically control weeds after they appear rather than prior to their emergence, was announced by J. M. Harris, entomologist with Niagara Chemical Division of Food Machinery and Chemical Corp. Mr. Harris reported to Southern Weed Conference members results obtained in a two year test with Dicryl at the Jackson,

Miss., research laboratory. In these trials, the new herbicide was found to provide control of a variety of weeds common to cotton crops—crabgrass, Brachiaria, watergrass, morning glory, pigweed, cocklebur, purslane and lamb's quarters, he said.

Net Sales Reported

WILMINGTON, DEL. — Hercules Powder Co. reported net sales and operating revenues of \$283,650,000 for 1959, an increase of 20% from 1958 sales of \$236,513,000.

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A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

HEALTHY SIGN . . .

Increased Use of Weed Control Chemicals Significant Over Past Ten-Year Period

THE EXTENT to which spray programs have increased and have been accepted in one Midwestern state is an eloquent commentary on the practical use to which pesticides are put not only on agricultural crops, but also to control weeds and other pests along roadways, power lines and industrial areas.

The State of Minnesota's Department of Agriculture, Dairy and Food Division of Plant Industry has issued a county by county summary of the amounts of weed control chemicals used in 1959 as compared to the reports of previous years. The increases are significant, particularly when considered over a period of ten years, beginning in 1950.

Here are some of the categories and figures reported by county weed and seed inspectors throughout the state:

The number of power sprayers rose from a total of 18,964 in 1950, to 39,015 in 1959, showing an increase each year between.

Acres of oats, wheat and barley sprayed with 2,4-D or MCP increased from 1,786,617 in 1950 to 3,146,625 in 1959, also showing a continual increase year after year.

Flax acres were first sprayed with 2,4-D or MCP in 1952, according to the report. That year, the total was 26,078 acres. In 1959, the total had increased to 192,090 acres. The biggest jump in this period was between 1953 and 1954, when the increase was 24,344 acres.

Among the most important crops treated with chemical sprays for control of pests was corn. In 1951, farmers applied chemicals to 98,646 acres. The next year it increased to 148,617 acres. In 1958, it had risen to 183,698 acres and 1954's total came to 254,527 acres.

After that, the increases really began to multiply. In 1955, the total number of treated corn acres had jumped to 746,720; 1956, to 1,082,135; 1957, 1,404,995; 1958, 1,752,520 and 1959, 2,247,277 acres.

Roads and highways also saw an increase in the miles sprayed. In 1950, 4,541 miles of state trunk highways were treated. In 1959, it was 9,298 miles. County and state aid roads sprayed were even more impressive, with 19,790 miles in 1950 and 29,203 miles in '59. Township roads, increasing from 8,522 miles in 1950 to 20,590 in 1959, presented the greatest increase, percentage-wise.

Total acres of grain sprayed in Minnesota in 1950 came to 1,910,917 and registered a gain nearly every year thereafter. The grand total of grain acres treated in 1959 was 5,661,237.

Back in 1950, only 13.3% of grain grown in the state was treated with any kind of spray, the report states. This percentage, in keeping with the increases noted above on various crops, has shown a healthy upward curve. Here is the year-by-year picture through 1959:

1951	15.1%
1952	17.3%
1953	18.1%
1954	22.6%
1955	28.6%
1956	35.8%
1957	36.0%
1958	44.58%
1959	44.61%

Naturally, this report reflects the situation in

only one state, but it seems to be of enough significance to show graphically the developments during the past decade. Reports of this nature cause the industry to stop and consider that it is starting another decade of activity on a much higher level than that known in 1950.

The question, of course, is whether the coming ten years will bring as much progress in acceptance and use. We think it will, particularly when one remembers that despite the large percentage gains in pesticide application over the years, still only 44.61% of the Minnesota grain crop had had any treatment at all. This means that there remains another more than 50% of farmers to sell before the full potential is realized.

'Poison' Fertilizer Scare Next?

IT IS INEVITABLE, we suppose, that the frenzied fear of alleged cancer-causing ingredients in pesticides should some day spill over into wondering about possible ill-health-giving properties of fertilizers.

A report from Ohio indicates that a farmer in that state is asking repayment from a liquid fertilizer manufacturer because of "contamination" to the grower's crops. The farmer claims that he has tested tobacco leaves that had been sprayed with liquid fertilizer, and found that the leaves contained traces of poisonous nickel. The metals could possibly cause cancer, nerve and blood ailments, he insists.

Ohio State University soil experts, called in to investigate the situation, could find no substantial basis for the farmer's claims. "It seems highly unlikely that there is enough toxic ingredient in any fertilizer to poison a plant," one agronomist observed. "We don't like to say anything is impossible, but we can't seem to make our tests duplicate those of the farmer."

The sensible attitude of these Ohio State University observers is commendable. It reveals their desire to take an objective view of the whole situation and not to be swayed by unfounded complaints about "poison" in fertilizers.

Since such accusations have been made, however, the trade may expect more to be coming from various people around the country. All the matter needs is a well-publicized incident of some kind to precipitate a "scare."

Continuing Battle

"The constant struggle between man and insects began long before the dawn of civilization, has continued without cessation to the present, and will continue as long as human and insect life endures.

"This struggle stems from a desire by both man and insects for the same thing at the same time. The intensity of the conflict is due to the vital importance to both man and insects of the things they desire, and it continues because the contestants are so equally matched."—NAC News and Pesticide Review.



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop area) basis with a mailing schedule which covers consecutively, one each week, three geographic regions (South, Midwest and West) of the U.S. On the fourth week, production personnel in fertilizer manufacturing and pesticide formulating plants throughout the U.S. are covered in depth. To those not eligible for this controlled distribution, Croplife's subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price 15¢.

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MEETING MEMOS



June 21-23—Eighteenth Annual Convention, Association of Southern Feed & Fertilizer Control Officials, Riverside Hotel, Gatlinburg, Tenn. For further information, write Maurice B. Rowe, secretary-treasurer, Department of Agriculture, 1119 State Office Building, Richmond 19, Va.

Meeting Memos listed above are being listed in this department this week for the first time.

Feb. 9-10—Utah Fertilizer Industry Conference: Feb. 9, Provo; Feb. 10, Ogden.

Feb. 9-11—Seventh Annual Agricultural Chemicals Conference, Texas Technological College, Lubbock, Texas.

Feb. 9-11—Southern Regional Liquid Fertilizer Conference, Rock Eagle 4-H Club Center, Eatonton, Ga.

Feb. 10-12—Fertilizer and Lime Conference, Pennsylvania State University, Nittany Inn, University Park, Pa.

Feb. 10-12—Midwestern Chapter, National Shade Tree Conference, Annual Meeting, Sheraton-Fontenelle Hotel, Omaha, Noel B. Wyson, 536 N. Harlem Ave., River Forest, Ill., Secretary-Treasurer.

Feb. 11—Conference on Use of Agricultural Chemicals, Oregon State College, Corvallis.

Feb. 11-13—Midwest Agronomists

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Fertilizer Industry meeting, Edgewater Beach Hotel, Chicago, Ill.

Feb. 16-17—Agricultural Pesticide Conferences. Feb. 16, Francis Scott Key Hotel, Frederick, Md.; Feb. 17, Elks' Home, Salisbury, Md., Dr. L. O. Weaver, dept. plant pathology, University of Maryland, College Park, chairman.

Feb. 17-18, 23-25—Indiana Ammonia Service School; Feb. 17, Lafayette; Feb. 18, Bedford; Feb. 23, Valparaiso; Feb. 24, Ft. Wayne; Feb. 25, Muncie.

Feb. 17-18—Pest Control Conference, Alabama Polytechnic Institute campus, Auburn, Ala. Sponsored by A.P.I. and the Alabama Association for Control of Economic Pests.

Feb. 19—Intermountain Meadow and Range Fertilization Conference, Colorado State University Student Union Bldg.

Feb. 23-25—Wood Society of America meeting, in conjunction with Western Wood Conference, Cosmopolitan Hotel, Denver, Colo.

Feb. 23-24—Ninth annual Pesticide Chemicals School, Clemson House, Clemson College, Clemson, S.C.

March 2-6—Annual Southern Safety Conference, Robert Meyer Hotel and George Washington Hotel, Jacksonville, Fla.

March 23-25—Western Agricultural Chemicals Assn., spring meeting, Miramar Hotel, Santa Barbara, Cal.

March 25-26—North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

March 30-31—Twenty-fourth annual meeting, Georgia Entomological Society, New Science Center, University of Georgia, Athens, Ga.

April 11-12—Eighth annual California Fertilizer Assn. Conference, sponsored by CFA Soil Improvement Committee, Fresno State College, Fresno, Cal.

June 12-15—National Plant Food Institute annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. R. Bertramson, State Col-

lege of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

July 27-30—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Sept. 29-30—Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.

Oct. 5-6—Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 17-21—48th annual National Safety Congress, Fertilizer Section, LaSalle Hotel, Chicago.

Nov. 13-15—California Fertilizer Assn., 37th annual meeting, del Coronado Hotel, Coronado, Cal.

DIVIDENDS

(Continued from page 3)

both phosphate and sulfur—the elements most frequently needed to improve range legume growth. It also shows how phosphate increases protein.

An estimated sample program is outlined below:

First Year—

Ground preparation cost per acre (approx.)	\$ 2.00
Feed and fertilizer application cost per acre (approx.)	2.00
4 lb. of Rosa Clover per acre (approx. cost)	4.80
400 lb. of pelleted superphosphate per acre (approx. cost)	9.80

First year total estimated cost per acre for program\$17.80

A conservative yield could be estimated at 3,000 lbs. per acre on a dry weight basis. For the first year at this yield, a ton of feed would cost only \$11.87.

Second Year—In the second year only fertilizer would be needed and the cost per ton of high quality feed would be only about \$5.00.

STORE SOLD

ALBANY, ORE. — Mrs. Lewis C. Morse, Sr., and Lewis C. Morse, Jr., have sold the local Morse's Seed and Garden store to Mr. and Mrs. Ray Shields.

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30 31	27 28 29 30	25 26 27 28 29 30 31	29 30 31

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- Providing feature material designed to help manufacturers and mixers to do a better job, to help dealers sell and to help farm advisors and educational people make sound recommendations.
- Keeping all industry alert to current and proposed government action.
- Providing a channel through which news and advertising can reach all segments of the industry.

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